FM 6-20
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FIELD MANUAL

FIELD ARTILLERY TACTICS AND OPERATIONS

HEADQUARTERS, DEPARTMENT OF THE ARMY

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No. 6-20

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Purpose

The purpose of this manual is to provide information and guidance for field artillery personnel, and for commanders and staffs of other arms, on the employment of field artillery.

1-2. Scope

a. The manual includes the techniques and procedures necessary for command, control, and coordination; operations; fire planning; and fire support coordination in all types of operations.

b. The manual should be used in conjunction with FM 6-140 and with other specific 6-series field manuals, such as FM 6-102.

c. The contents of this field manual apply to all types of warfare unless otherwise stated.

1-3. Changes or Comments

Users of this manual are encouraged to submit recommended changes or comments to improve the manual. Comments should be keyed to the specific page, paragraph, and line of the text in which the change is recommended. Reasons should be provided for each comment to insure understanding and complete evaluation. **Comments should be prepared using DA Form 2028 (Recommended Changes to Publications) and forwarded direct to the Commandant, US Army Field Artillery School, ATTN: ATSFA-PL-FM, Fort Sill, Oklahoma 73503.** Comments involving safety of personnel should be transmitted by electronic means.

Section II. MISSION AND FUNCTIONS

1-4. Mission of Field Artillery

a. Mission. Field Artillery is a combat arm and its mission is to provide continuous and timely fire support to the force commander by destroying or neutralizing, in priority, those targets that jeopardize the accomplishment of his mission.

b. Functions. In accomplishing its mission, field artillery will—

(1) Support the maneuver forces with continuous, timely, close, and accurate fires.

(2) Deliver counterbattery fires throughout the range of the weapons systems.

(3) Extend depth to combat by delivering fires on logistical installations, reserves, command posts, communication facilities, and other targets throughout the area of influence of the supported force.

1-5. The Field Artillery System

The field artillery system consists of all of those elements that are necessary to obtain the desired effect on the target. For a detailed discussion of the field artillery system elements, see FM 6-140.

1-6. General Considerations

The development of nuclear and chemical weapons and their delivery systems has had an impact on the tactics of all combat arms. Even though nuclear weapons, and biological and chemical agents may not be employed against U.S. forces, they pose a constant threat to all operations. When the threat of nuclear war exists, nonnuclear war will assume many of the aspects of nuclear war, including detailed planning for the initiation of nuclear combat and a continuing analysis of friendly vulnerability. Similarly, those tactics which apply to the employment of field artillery in nonnuclear warfare are applicable under chemical conditions, to include the detailed planning for the initiation of chemical operations, and the defense against enemy use of biological and chemical agents.

CHAPTER 2

FIELD ARTILLERY CHARACTERISTICS

Section I. CLASSIFICATION OF FIELD ARTILLERY WEAPONS

2–1. Classification by Weapon

Field artillery weapons are classified as cannons, missiles, and aerial field artillery.

a. Field artillery cannons are classified by type as guns and howitzers. They may be further classified by their caliber length which is determined by dividing the total length of the bore by its diameter.

(1) Guns have relatively long barrels—over 30 calibers in length—normally a low angle of fire, and a high-muzzle velocity.

(2) Howitzers have medium-length barrels, 20 to 30 caliber length, a relatively high angle of fire, and a medium-muzzle velocity.

b. Cannons are further classified according to caliber by tube diameter. The diameter is normally measured in millimeters. One inch is approximately 25 millimeters.

(1) Light. 120 mm and less.

(2) Medium. 121 mm through 160 mm.

(3) Heavy. 161 mm through 210 mm.

(4) Very heavy. Greater than 210 mm.

c. Missiles are classified by type as rockets or guided missiles.

(1) A rocket is aimed by orienting the launcher; it cannot be guided further after it has been fired.

(2) A guided missile is subject to course correction or alteration while the missile is in flight.

d. Missiles are further classified by range characteristics.

(1) Short-range *rocket.* Maximum range is less than 30 kilometers.

(2) Long-range *rocket.* Maximum range is 30 kilometers or more.

(3) Short-range *guided missile.* Maximum range is less than 100 kilometers.

(4) Medium-range *guided missile.* Maximum range is at least 100 kilometers, but less than 500 kilometers.

(5) Long-range *guided missile.* Maximum range is 500 kilometers or more.

e. Aerial field artillery weapons are classified by the type of aircraft platform and by the type of armament subsystem applicable to the airframe:

(1) 2.75 folding fin aerial rocket (FFAR).

(2) 7.72 mm MG and 40 mm turret gun.

(3) 20 mm gun pods.

2–2. Classification by Means of Transport

Field artillery weapons are also classified according to their method of transport, as follows:

a. Towed. Weapons that are mounted on carriages designed to be towed or transported by a separate vehicle, generally termed a prime mover. A towed weapon may also be propelled by a mounted auxiliary propulsion means.

b. Self-Propelled (SP). Cannons and launchers that are installed on carriages which provide automotive power for the vehicle and the weapon.

c. Aerial. Weapons that are mounted upon or structurally integrated with aircraft which serve as the primary means of mobility, and from which the weapons can be fired.

2–3. Classification by Transportability

Field artillery weapons are also classified according to the method of transportation which can be used to deliver the weapons to a combat area. All field artillery weapons can be transported by road, rail, or ship. Weapons that can be moved by air are classified as follows:

a. Helicopter Transportable. Field artillery weapons which can be carried by rotary-wing aircraft and landed sufficiently assembled to permit immediate employment as in airmobile operations.

b. Air Transportable.

(1) *Airdrop or assault landing.* Weapons that are delivered in assault landing aircraft or by air drop will be capable of landing on unprepared surfaces within enemy territory. Field artillery weapons so employed must be capable of immediate effective employment.

(2) *Subsequent delivery.* During the subsequent delivery, weapons must be capable of being transported in light and medium-transport or assault-type aircraft. All field artillery weapons in subsequent delivery should be capable of effective employment within one (1) hour after delivery.

(3) *Heavy air landing.* Field artillery weapons moved during this phase of the air landings must be capable of being transported in heavy transport-type aircraft.

Section II. CAPABILITIES AND LIMITATIONS OF FIELD ARTILLERY

2-4. General

Field artillery is the principal element of an Army force for the delivery of fire by cannons or missiles on surface targets. Field artillery operations are those combat operations of field artillery units in support of other combat forces. Field artillery is prepared to provide fire support under all conditions of warfare.

a. In the nonnuclear battle, the field artillery provides close and continuous nonnuclear field artillery fire support to maneuver forces. Field artillery is ideally suited for the neutralization and destruction of enemy units.

b. In the nuclear battle, the field artillery provides continuous nuclear and nonnuclear field artillery fire support to maneuver forces. High priority targets are the enemy's nuclear delivery means. Priority of position areas is normally given to nuclear capable delivery units.

c. The employment of field artillery under chemical conditions is discussed in paragraphs 8-28 through 8-31.

d. The employment of field artillery during stability operations is discussed in paragraphs 7-54 through 7-64.

2-5. Capabilities of Field Artillery

Field artillery is capable of—

a. Shifting the fires of its weapons rapidly within a large area and on a wide front without displacing.

b. Massing fires on one or more targets.

c. Placing indirect fires on targets from firing positions in defilade.

d. Accurately delivering sustained fires with appropriate ammunition under all conditions of visibility, weather, and terrain throughout the zone of action of the supported unit from weapons emplaced laterally and in depth in the area of operations of the supported unit.

e. Placing fire *on* targets in defilade.

f. Delivering accurate fires without adjustment.

g. Displacing rapidly to new positions.

h. Destroying point targets using assault fire or precision fire techniques.

i. Conducting direct fire against enemy forces from cannon or aerial field artillery.

j. Providing aerial field artillery fire support.

k. Providing battlefield illumination.

l. Target acquisition.

2-6. Limitations of Field Artillery

Field artillery is limited only in that—

a. Its mission effectiveness is reduced when it is required to engage in close combat.

b. Its effectiveness is reduced and its vulnerability is increased during displacement operations.

c. Vulnerable to enemy air and counterbattery fire.

d. Effectiveness against moving tanks is low due to the necessity of a direct hit to effectively defeat a single armored (tank) vehicle.

e. Its ability to support an initial amphibious assault.

f. In mountainous terrain, unobserved fires are generally unreliable, and transfer of fires is difficult.

CHAPTER 3

FIELD ARTILLERY ORGANIZATION AND ORGANIZATION FOR COMBAT

Section I. FIELD ARTILLERY ORGANIZATION

3–1. General

The objective of field artillery organization is to provide an organization for combat which can most effectively and economically support the maneuver forces. The organization of field artillery units and field artillery headquarters is shown in detail in appropriate tables of organization and equipment (TOE).

3–2. Army Group and Theater Army Field Artillery

Army group and theater army field artillery consists only of the field artillery staff sections necessary to fulfill the field artillery requirements of these headquarters. Normally, field artillery units are not retained under the direct control of army group or theater army.

3–3. Field Army Field Artillery

Field army field artillery consists of units assigned or attached to the field army and retained under command of the field army commander. The field army field artillery officer exercises, in the commander's name, operational control of these units. *Field artillery with the army* includes the field army field artillery and the field artillery with its subordinate corps.

3–4. Corps Field Artillery

Corps field artillery consists of a headquarters and headquarters battery and those field artillery units assigned or attached which are not further attached to subordinate elements of the corps. *Field artillery with the corps* include the corps field artillery and all other field artillery units which are organic or attached to subordinate elements of the corps.

3–5. Division Field Artillery

Division field artillery consists of a division field artillery headquarters and headquarters battery, other units organic to division field artillery, and field artillery units attached to the division field artillery. The division field artillery is organized for combat to support the division scheme of maneuver. Flexibility is achieved through the assignment of standard tactical missions to the units of the division field artillery. Additional field artillery support is normally provided by corps field artillery units with the missions of general support, general support reinforcing, or reinforcing. Corps field artillery units may be attached to the supported division when command and control is considered no longer feasible.

3–6. Field Artillery Group

The field artillery group consists of a headquarters and headquarters battery and attached units. The group provides flexibility in organization for combat since the number, type, and caliber of the attached units may be varied to meet the situation. Although units attached to a group may be of any caliber and type, mixed calibers and types within a group permit greater flexibility in employment. The field artillery group provides centralized training and tactical control, as well as a limited degree of administrative and logistical supervision.

3–7. Field Artillery Battalion

The field artillery battalion is both a tactical and an administrative organization. A field artillery battalion may be identified by the following:

a. Cannon, rocket, or missile.

b. Towed, self-propelled, or aerial.

c. Divisional or nondivisional.

d. Organized as—

(1) Headquarters and headquarters battery and two or more, usually three, cannon or missile batteries and a service battery, or

(2) Headquarters, headquarters and service battery, and two or more, usually three, cannon, aerial, or missile batteries.

3-8. Field Artillery Battalion Group

In the absence of a field artillery group or other suitable tactical headquarters, one battalion may be attached to another battalion to form a battalion group. The battalion group headquarters functions only as a tactical headquarters for *limited* periods. The numerical designation of the battalion group is that of the battalion providing the battalion group commander.

Section II. TACTICAL MISSIONS

3-9. Assignment of Tactical Missions

a. General. The fire support responsibilities to be executed by field artillery units are designated by the assignment of tactical missions. Tactical missions for field artillery units are assigned by the force commander on the recommendation of the force field artillery commander and are published in the force operations order, the fire support annex, and the field artillery fire support appendix.

b. Authority of Subordinate Field Artillery Commanders. A subordinate field artillery commander has the authority, inherent in his command responsibility, to issue orders to his subordinate elements that are necessary to the accomplishment of his assigned mission. This includes organizing for combat and assigning tactical missions, provided that such action does not degrade his overall capability to accomplish his assigned mission nor reduce the degree of centralized control retained by the commander who originally assigned the tactical mission.

3-10. Standard Tactical Missions

Field artillery divisional battalions (units) may be assigned one of four standard tactical missions. Listed in descending order of the amount of centralized control retained, they are *general support, general support-reinforcing, reinforcing,* and *direct support.* Each of the standard tactical missions places specific inherent responsibilities upon the units assigned the mission. The responsibilities inherent to each of the standard missions are identified in figure 3-1, and discussed as follows:

a. General Support. A field artillery unit assigned the mission of general support provides artillery support for the force as a whole. Units with this mission remain under the control of the force field artillery commander and provide the force commander with a means of directly influencing the action.

b. General Support-Reinforcing. A field artillery unit given the mission of general support-reinforcing, furnishes field artillery fires in support of the force as a whole and, in addition, reinforces the fires of another field artillery unit. A quick-fire communication channel is established with the reinforced unit to assist in calls for fire. A unit with this mission remains under the control of the force field artillery commander. Calls for fire from the force field artillery headquarters take precedence over those from the reinforced unit.

c. Reinforcing. A field artillery unit assigned the mission of reinforcing augments the fires of another field artillery unit. The reinforcing unit remains under the command of the commander assigning the reinforcing mission, but its fires are planned and controlled by the reinforced unit. A quick-fire communication channel and liaison are established between the reinforced and the reinforcing unit by the reinforcing unit to assist in calls for additional fires. The reinforced unit calls directly on the reinforcing unit for fires.

d. Direct Support. A field artillery unit assigned the mission of direct support provides close and continuous field artillery support to a designated maneuver element and must coordinate its fires with those of the element it supports. The direct support field artillery commander positions his unit as necessary to properly support the operations of the supported element. When possible, the same field artillery unit is habitually placed in direct support of the same maneuver element in order to assist in combined arms teamwork. A field artillery unit with a mission of direct support remains under the command of the higher field artillery commander assigning the mission. The direct support mission is most frequently applied to place a field artillery battalion in support of an infantry, mechanized, or armored brigade. This mission is appropriate for a single battery, a battalion group, or a field artillery group, when it is desired to employ one field artillery element to support a single maneuver element. However,

FIELD ARTILLERY WITH A TACTICAL MISSION OF- (A)	ANSWERS CALLS FOR FIRE IN PRIORITY FROM-- (B)	ESTABLISHES LIAISON WITH- (C)	ESTABLISHES COMMUNICATION WITH- (D)	HAS AS ITS ZONE OF FIRE-- (E)	FURNISHES FORWARD OBSERVERS (F)	IS POSITIONED BY-- (G)	HAS ITS FIRES PLANNED BY- (H)
GENERAL SUPPORT	1. FORCE FIELD ARTILLERY HEADQUARTERS. 2. OWN OBSERVERS	NO INHERENT REQUIREMENT.	NO INHERENT REQUIREMENT.	ZONE OF SUPPORTED UNIT/FORMATION.	NO INHERENT REQUIREMENT.	FORCE FIELD ARTILLERY HEADQUARTERS.	FORCE FIELD ARTILLERY HEADQUARTERS.
GENERAL SUPPORT REINFORCING	1. FORCE FIELD ARTILLERY HEADQUARTERS. 2. REINFORCED FIELD ARTILLERY UNIT. 3. OWN OBSERVERS.	REINFORCED FIELD ARTILLERY UNIT.	REINFORCED FIELD ARTILLERY UNIT.	ZONE OF SUP— PORTED UNIT/ FORMATION TO INCLUDE ZONE OR REINFORCED FIELD ARTILLERY UNIT.	UPON REQUEST OF REINFORCED FIELD ARTILLERY UNIT, SUBJECT TO PRIOR APPROVAL OF FORCE FIELD ARTILLERY HEADQUARTERS.	FORCE FIELD ARTILLERY HEADQUARTERS, OR, SUBJECT TO PRIOR APPROVAL, REINFORCED FIELD ARTILLERY UNITS.	FORCE FIELD ARTILLERY HEADQUARTERS.
REINFORCING	1. REINFORCED FIELD ARTILLERY UNIT. 2. OWN OBSERVERS 3. FORCE FIELD ARTILLERY HEADQUARTERS.	REINFORCED FIELD ARTILLERY UNIT.	REINFORCED FIELD ARTILLERY UNIT.	ZONE OF FIRE REINFORCED FIELD ARTILLERY UNIT.	UPON REQUEST OF REINFORCED FIELD ARTILLERY UNIT.	REINFORCED FIELD ARTILLERY UNIT OR AS ORDERED BY FORCE ARTILLERY HEADQUARTERS.	REINFORCED FIELD ARTILLERY UNIT.
DIRECT SUPPORT	1. SUPPORTED UNIT. 2. OWN OBSERVERS 3. FORCE FIELD ARTILLERY HEADQUARTERS.	SUPPORTED UNIT (DOWN TO BATTALION LEVEL.)	SUPPORTED UNIT.	ZONE OF SUPPORTED UNIT.	TO EACH - COMPANY SIZE MANEUVER ELEMENT OF SUPPORTED UNIT.	UNIT COMMANDER, AS DEEMED NECES— SARY OR AS ORDERED BY FORCE FIELD ARTILLERY HEADQUARTERS.	DEVELOPS OWN FIRE PLAN.

Figure 3–1. US terminology-field artillery tactical missions (inherent responsibilities).

SERIAL	ARTILLERY PLACED--	ANSWER CALLS FOR FIRE IN PRIORITY FROM--	PROVIDES LIAISON, COMMUNICATION AND OBSERVERS TO----	IS MOVED AND DEPLOYD BY--	NOTES
(A)	(B)	(C)	(D)	(E)	(F)
			COMMAND		
	UNDER COMMAND (NOTE 1)	1. THE COMMANDING FORMATION/ UNIT. 2. ANY OTHER FORMATION/UNIT BUT ONLY ON THE APPROVAL OF THE COMMANDING FORMATION/UNIT.	THE COMMANDING FORMATION/UNIT.	TO COMMANDING FORMATION/UNIT.	1. THIS TERM MAY BE QUALIFIED SO THAT THE ARTILLERY IS PLACED UNDER COMMAND FOR A SPECIFIC PURPOSE (E.G., FOR MOVEMENT OR FOR ADMINISTRATION OR FOR DAILY MAINTENANCE) OR FOR A LIMITED PERIOD OF TIME (E.G., FROM ....TO...HOURS).
			CONTROL		
2	IN DIRECT SUPPORT (NOTES 2, 3, AND 4)	1. THE DIRECTLY SUPPORTED FORMATION/UNIT. 2. ANY OTHER FORMATION/UNIT IF AUTHORIZED BY THE CONTROLLING HQ.	THE DIRECTLY SUPPORTED FORMATION/UNIT.	NEXT HIGHER ARTILLERY HQ.	2. THE TERM "UNDER COMMAND FOR MOVEMENT" MAY BE ADDED TO THE TERMS "IN DIRECT SUPPORT" AND "IN SUPPORT."
3	IN SUPPORT (NOTES 2, 3 AND 5)	1. THE SUPPORTED FORMATION/UNITS. 2. ANY OTHER FORMATION UNIT IF AUTHORIZED BY THE CONTROLLING HQ.	NO INHERENT REQUIREMENT.	NEXT HIGHER ARTILLERY HQ.	3. ARTILLERY PLACED "IN DIRECT SUPPORT" OF A FORMATION/UNIT MAY ALSO BE PLACED "IN SUPPORT" OF OTHER FORMATION UNITS.
4	AT PRIORITY CALL (NOTES 4 AND 5)	1. THE FORMATION/UNIT TO WHICH PLACED AT PRIORITY CALL. 2. OTHER SUPPORTED FORMATIONS/ UNITS 3. ANY OTHER FORMATIONS/UNIT AUTHORIZED BY THE CONTROLLING HQ.	NO INHERENT REQUIREMENT.	NEXT HIGHER ARTILLERY HQ.	4. ARTILLERY PLACED "IN DIRECT SUPPORT" OF A FORMATION/UNIT MAY ALSO BE TEMPORARILY PLACED "AT PRIORITY CALL" TO ANOTHER FORMATION/ UNIT. THIS WILL ONLY BE FOR A SPECIFIED TIME, OPERATION OR PHASE OF AN

Figure 3-2. UK-CA-AS terminology-artillery command and control.

SERIAL	ARTILLERY PLACED	ANSWER CALLS FOR FIRE IN PRIORITY FROM	PROVIDES LIAISON COMMUNICATIONS AND OBSERVERS TO---	IS MOVED AND DEPLOYED BY--	NOTES
(A)	(B)	(C)	(D)	(E)	(F)
			COMMAND		
					OPERATION AND CAN ONLY BE DONE WHEN THE COMMANDER DECIDES THAT THE PRIORITY OF EFFORT IMPLICIT IN SERIAL 2.1 IS NO LONGER OVERRIDING. WHEN ARTILLERY IS SO PLACED, IT DOES NOT WITHDRAW ITS LIAISON, COMMUNICATIONS AND OPS FROM THE DIRECTLY SUPPORTED FORMATION/UNIT. 5. ARTILLERY PLACED " IN SUPPORT" OF A FORMATION/ UNIT MAY ALSO BE PLACED "AT PRIORITY CALL" TO ANOTHER FORMATION/UNIT.

these units must be augmented with forward observer and liaison personnel and their equipment.

3-11. Modified Missions

Whenever the intent of the commander cannot be accurately conveyed by the use of a standard tactical mission, a standard mission may be changed, limited, or amplified by appropriate instructions. A modification may change one or more of the inherent responsibilities, such as inserting an additional unit in the priorities for answering calls for fires, or a modification may affect the overall capability of the unit to perform its mission, such as limiting the amount of ammunition a unit may expend in performing a certain mission. A standard mission should not be modified to the point where it is no longer recognizable. The direct support mission, except in counterguerrilla operations, is normally not modified, since it is designed to provide the greatest degree of responsiveness to committed maneuver elements.

3-12. Nonstandard Missions

If none of the standard tactical missions—even when modified—adequately expresses the intent of the issuing authority, a nonstandard mission may be assigned. It is essential that the nonstandard mission be stated in terms of explicit responsibilities assigned to preclude misunderstanding by the commander receiving the nonstandard mission. Broad statements of missions (e.g., "fire in support . . .," "augment the fires of . . .," "support . . .") allow interpretation of how such tasks are to be accomplished and should be avoided. The surest way to avoid misunderstanding is to state the requirement in the area of *each* of the seven responsibilities (fig 3-1) for the situation concerned; if requirements do not exist in certain areas, statements to this effect should be included (fig 3-1). The nonstandard mission should be considered only when it has been determined that a standard tactical mission will not adequately convey the requirement for field artillery fire support. This usually occurs when insufficient field artillery is available and one field artillery unit is required to meet the fire support requirements of more than one maneuver element.

3-13. Warning Orders

Warning orders are used to alert units to pending changes. Also certain phrases can be included in operation orders and fire support documents to do this. Any foreseeable change in the tactical mission should be included to allow preparation for such changes.

3-14. Standardization Agreement

a. General. The armies of the United States, United Kingdom, Canada, and Australia (ABCA) have agreed to adopt specific terminology for command and control of field artillery and for field artillery tactical missions.

b. US Terminology. Terminology used by the US for field artillery tactical missions is shown in figure 3-1.

c. UK-CA-AS Terminology. Terminology used by the United Kingdom, Canada, and Australia for field artillery command and control is shown in figure 3-2.

d. Coordination. Personnel involved in ABCA operations must know and understand the terminology shown in figures 3-1 and 3-2 in order to insure effective coordination among member nations.

Section III. ORGANIZATION FOR COMBAT

3-15. General

a. Field artillery is organized for combat to insure that the maneuver elements, and the force as a whole, are provided the required field artillery support. Organization for combat consists of placing each field artillery unit in a tactical organization and assigning a tactical mission to each.

b. The purpose of organizing field artillery for combat is to provide the best possible support for the scheme of maneuver by employing all available weapons and exploiting their capabilities. Therefore, the mission, the concept of operation, and the situation of the supported force must be analyzed prior to the development of an effective field artillery organization for combat.

c. Other factors which have an impact on organization for combat are as follows:

(1) Number and types of field artillery units available.

(2) Capabilities of the weapon systems.

(3) Availability of suitable position areas.

(4) Availability of ammunition.

(5) Availability of other fire support agencies.

(6) Intelligence concerning the enemy, particularly target intelligence.

(7) Weather.

(8) Terrain.

(9) Unit operational readiness.

(10) Future operations.

3–16. Fundamentals in Organizing Field Artillery for Combat

In the development of an effective organization for combat, the following fundamentals must be considered and placed in proper balance:

a. Maximum Feasible Centralized Control. Field artillery is most effective when control is centralized at the highest level consistent with its fire support capabilities and the requirements of the overall mission. Centralized control of field artillery permits flexibility in employment and aids in the massing of fires; it also insures that effective fire support is provided to each subordinate element of the command and to the force as a whole. Each of the standard tactical missions represents a different degree of centralized control. The optimum degree of centralized control varies with each tactical situation and is achieved through proper task organization and assignment of appropriate tactical missions. However, the following general rules apply:

(1) A high degree of centralized control is desired in a defensive situation. Since the enemy has the initiative, it is difficult to predict when and where he will strike. A high degree of centralized control insures flexibility of employment, which enhances the force commander's ability to influence the action wherever it may develop.

(2) A lesser degree of centralized control is acceptable in offensive situations because the supported force possesses the initiative. Field artillery commanders are granted wider latitude in the employment of their artillery in order to assist the maneuver elements in retaining the initiative and maintaining the momentum of the attack. The responsiveness of the field artillery is more sharply focused on the specific fire support requirements of the maneuver elements of the force.

b. Adequate Field Artillery Support for Committed Maneuver Units. Adequate field artillery support is normally considered to be, as a minimum, one field artillery battalion in direct support of one committed brigade. However, consideration must be given to requirements for additional fire support because of the composition and zone of action or sector of the committed force, enemy capabilities, and the requirement for massing fires.

c. Weight to the Main Attack in the Offense and Additional Strength to the Most Vulnerable Area in the Defense. Weight is provided by positioning additional field artillery units so that they can fire into the critical areas and by assigning to these units the missions of *general support-reinforcing* or *reinforcing* the appropriate direct support field artillery units. In addition to the assignment of tactical missions, weight to the main attack is provided by the—

(1) Assignment of position areas and zones of fire to general support-reinforcing and reinforcing field artillery.

(2) Allocation of ammunition.

d. Facilitate Future Operations. When it is anticipated that future field artillery support requirements will be derived from the force commander's concept and scheme of maneuver, including anticipated tactical contingencies, on-order missions are employed to assist future operations. For example, adequate field artillery support must be provided to the reserve when it is committed. This is done by issuing warning orders to designated field artillery units to be prepared to support the reserve when it is committed by positioning these units in proximity to likely areas of employment and by limiting ammunition expenditures, when necessary, prior to an on-order mission.

e. Immediately Available Field Artillery Support With Which the Commander Can Influence the Action. The force field artillery retains control of immediately available field artillery with which the force commander can influence the action. This field artillery consists of organizations assigned tactical missions of general support or general support-reinforcing.

3–17. Field Artillery Support at Specific Echelons

Field artillery support requirements at specific echelons govern the organization for combat.

a. Division Field Artillery. Division field artillery provides close and continuous fire support to maneuver elements and employs counterbattery fires, counterflak fires, harassing and interdiction fires, and other fires, as required, to support the maneuver force.

b. Corps and Army Field Artillery. Army and corps field artillery provides depth to combat and augments the fire support provided by the field artillery with the divisions. Specifically, corps and army field artillery supports combat operations as follows:

(1) Army cannon battalions are usually attached to corps and then further attached to field artillery groups or to divisions.

(2) Army short- and medium-range field artillery rocket and missile battalions are usually attached to corps. These battalions may be further attached to field artillery groups or to divisions.

(3) Army long range field artillery missile battalions are usually retained under army field artillery control.

3–18. Attachment

Attachment is *not* a tactical mission; it is a status of command. Field artillery attached to a force for an operation is under the command of the commander of the force to which attached and is assigned tactical missions approved by the force commander. The force commander is responsible for providing administrative and logistical support to the attached field artillery. Normally, field artillery units are not attached to a force unless the control requirements cannot be adequately executed through the assignment of a tactical mission or unless control requirements dictate the establishment of a command relationship between the force commander and his supporting field artillery commander.

CHAPTER 4

COMMAND AND CONTROL

Section I. COMMAND AND STAFF RESPONSIBILITIES

4–1. Field Artillery Officer (Theater Army, Army Group, and Field Army)

a. In theater army, army group, and field army, the senior field artillery officer in the field artillery staff section is designated the *field artillery officer*. He is the special staff officer who advises the commander on fire support and other field artillery matters.

b. The duties and responsibilities of the field artillery officer are assigned by the commander and normally include, but are not limited to, the following:

(1) Determines the number and types of nonorganic field artillery units required by the forces in the command, including special equipment for these units.

(2) Determines field artillery requirements and recommends the allocation of available ammunition.

(3) Recommends the allocation of the various types of field artillery units to subordinate commands; recommends the field artillery task organization of, and the assignment of personnel to, these units; and estimates replacement requirements for the units.

(4) Supervises the training of units and replacement personnel within the command and the operation of field artillery schools that are under the control of the commander.

(5) Publishes information and intelligence of interest to the field artillery.

(6) Plans the reception and processing of units within the command.

(7) Exercises, in the commander's name, operational control of those units which have not been assigned or attached to subordinate units.

(8) Provides for target analysis and damage assessment of nuclear fires employed on surface targets by own forces.

(9) Studies and evaluates enemy field artillery capabilities.

(10) Coordinates field artillery survey within the command with higher and adjacent commands.

(11) Supervises the operation of the fire support element (FSE) of the tactical operations center (TOC).

(12) In conjunction with the air defense and aviation officer, develops the airspace utilization plan.

c. Additional information on the functions of the artillery officer is contained in FM 101–5.

4–2. Field Artillery Commanders

a. Corps, Division, and Task Force. In corps, division, and task force, the senior field artillery officer of the field artillery headquarters of that force is the field artillery *commander*. He commands the field artillery units that are retained under control of the force. He advises the force commander and his staff on all field artillery matters. Normally, he is the fire support coordinator (FSCOORD) for the force. The duties and responsibilities of the field artillery commander of the corps, division, or task force include, but are not limited to, the following:

(1) Performs as FSCOORD for the force and, as such, is responsible for the functions stated in chapter 6.

(2) Advises on matters pertaining to field artillery support and to deception operations by field artillery.

(3) Determines requirements for field artillery support and recommends the field artillery task organization.

(4) Provides information on the status of field artillery ammunition on hand; recommends the field artillery ammunition required supply rate (RSR); provides an estimate of the adequacy of the field artillery ammunition available supply rate (ASR); and recommends the ASR for subordinate commands.

(5) Recommends the allocation and assignment of special ammunition for field artillery missions and the field artillery special ammunition load (SAL) for artillery units, supply points, and depots.

(6) Is responsible for and assists in the preparation of the fire support annex and the *field artillery* fire support *appendix* thereto.

(7) Coordinates field artillery target acquisition, meteorological operations, and survey within the command and with higher and adjacent commands.

(8) Studies and evaluates enemy field artillery capabilities.

(9) Prepares the field artillery portion of training programs and exercises special staff supervision over field artillery training throughout the command.

(10) Monitors the operational readiness of field artillery units and advises the commander and staff of related problems.

(11) Provides for target analysis and damage assessment of nuclear fires employed on surface targets.

(12) Supervises the operation of the FSE, when appropriate.

(13) In conjunction with air defense and aviation officers, assists in developing the airspace utilization plan.

b. Field Artillery Group. In addition to the tasks inherent in the tactical missions assigned the group, the field artillery group commander's responsibilities include, but are not limited to, the following command functions:

(1) Controls the fires of the group.

(2) Coordinates survey control for the attached elements of the group.

(3) Directs the training of the group headquarters and in some situations, the training of the battalions (units) attached to the group.

(4) Provides logistical and administrative assistance to battalions (units) attached to the group.

(5) Coordinates and disseminates meteorological information.

(6) When directed, maintains an alternate corps field artillery command post.

c. Field Artillery Battalion. The field artillery battalion commander is responsible for executing the fire support responsibilities inherent in the assigned tactical mission.

Section II. CONTROL RESPONSIBILITIES

4-3. The Combined Arms Team

Field artillery is an element of the combined arms team employed by the force commander to accomplish his mission. When field artillery is assigned or attached to the supported unit, the field artillery officer is a subordinate commander of the supported unit commander. When field artillery is neither assigned nor attached to, but is placed in support of the supported unit, the field artillery commander's relationship to the supported unit commander is that of an adviser and an independent commander who must provide effective field artillery support through his assigned tactical mission.

4-4. Command Channels

There is no chain of command between the field artilleries of the various echelons (army, corps, division); therefore, instructions for the corps field artilleries of a field army are issued to the division commanders in the name of the corps commander. Each field artillery commander commands only the field artillery at his echelon. However, direct communication channels are established between the field artilleries of the various echelons for the coordination of field artillery fires.

Section III. LIAISON

4-5. Established Liaison

Liaison is established between units to insure mutual understanding and for unity of purpose and action. Liaison is usually performed by a unit representative who visits or lives and works with another unit to exchange information. Liaison established by field artillery units may encompass additional duties which are peculiar to the field artillery.

4-6. Command Liaison

Through personal contact, field artillery commanders establish command liaison with supported and reinforced commanders. Personal liai-

son is the most effective type of liaison. The liaison established by commanders is maintained by liaison (fire support) officers furnished by the units responsible for its establishment.

4–7. Liaison Officers and Fire Support Officers

a. The liaison officer is the field artillery commander's personal representative to the unit with which liaison is maintained. His duties consist of exchanging information relative to the plans, situation, and policies between the two units and the promotion of cooperation and coordination of effort. Frequent changes of liaison officers are not desirable; however, in situations requiring the prolonged absence of liaison officers from their parent unit, it may be desirable to rotate them back to the parent unit to keep them informed of current information required in their duties.

b. The fire support officer is the full time representative from a direct support field artillery battalion. He works at the command post of a supported maneuver battalion or brigade. His duties include those of a liaison officer and the added responsibility of coordinating all fire support on surface targets. As the senior full-time field artillery officer present, he serves as the FSCOORD in the absence of the field artillery commander. Thus, he is differentiated from the liaison officer due to the difference in basic duties, although there exists some duplication in both positions. Because the field artillery commander conducts frequent visits to the supported maneuver unit command posts, he is able to keep the fire support officers at brigade and battalion level abreast of the current situation, plans, and policies, thus reducing the possible requirement for periodic rotation of the fire support officer back to the parent unit.

c. The principal duties of liaison officers and fire support officers are contained in FM 6–140 and in FM 101–5.

4–8. Staff Liaison

Liaison is not restricted to liaison officers but may be performed by any staff officer or other designated officer. Liaison between staff sections of one unit and similar staff sections of an associated unit is desirable for further cooperation and coordination; e.g., liaison may be established with the engineers in regard to survey control and with the air weather service in regard to meteorological data.

Section IV. FIELD ARTILLERY ESTIMATES AND REQUIREMENTS

4–9. Responsibilities for Field Artillery Estimates

a. An estimate of the situation is a logical process by which a commander considers all the circumstances affecting the military situation and decides on the course of action he will take to accomplish his mission.

b. Field artillery estimates are made to determine the number and types of field artillery units and the amount of ammunition required to support the contemplated operation and to determine the allocations of units and ammunition to lower echelons.

c. The *field artillery officer* of an echelon ordering or conducting an operation is responsible for preparing the estimate of field artillery requirements. In preparing the estimate, he considers the eventual organization for combat and the requirement to assemble the necessary field artillery and ammunition at the time and place desired. Subordinate field artillery commanders may assist in the preparation of the estimate.

4–10. Basis of Field Artillery Estimates

a. The amount and types of field artillery required to support an operation depend primarily on the commander's plan, the availability of field artillery and other fire support resources, the type of enemy resistance expected, the duration of the operation, and the terrain. Units making supporting attacks or defending in less critical areas may be allowed only limited amounts of field artillery in order to permit the *massing of field artillery* in areas where decisive results may or must be achieved.

b. In preparing the estimate of field artillery requirements, the field artillery officer determines the minimum amount of field artillery required to—

(1) Place the required volume of fire on all confirmed and suspected targets.

(2) Attack all enemy installations that can influence planned operations during any anticipated phase.

4–11. Estimate of Field Artillery Requirements

Field artillery requirements will vary widely and will differ for each tactical situation. FM 101–10–1 contains tables showing basic loads and experience tables for ammunition which are of assistance in making field artillery estimates for various types of operations. As the operation progresses, commanders should develop accurate experience data applicable to local conditions for use as a guide in the conduct of future operations. Factors which must be considered in estimating the number and types of field artillery units and the amount of ammunition required are the—

a. Composition, tactics, disposition, and organization of the enemy forces.

b. Availability and known or expected use of field artillery units and ammunition.

c. Type of operation (attack, defense, delay, or special operation).

d. Availability of reinforcing fires from higher field artillery headquarters.

e. Availability and known or expected use of other fire support means.

f. Terrain, weather, and operational environment.

g. Available time.

h. Main and secondary attack plans and counterattack plans.

i. Allowance for losses duuring combat.

j. Logistical capabilities.

k. Capacity of road net.

l. Availability and type(s) of aircraft support both for movement and resupply.

CHAPTER 5

FUNDAMENTALS OF EMPLOYMENT

Section I. GENERAL

5–1. General

Certain fundamentals of employment of field artillery must be considered during all types of operations to insure that the field artillery is able to provide the support necessary for the accomplishment of the mission. These fundamentals are outlined in this chapter.

5–2. Requirements

The field artillery commander is responsible for insuring that his unit is positioned so that it provides the field artillery support inherent in his mission. Providing effective support requires—

a. That the mobility of the field artillery be equal to or greater than that of the supported force.

b. That all field artillery commanders be informed of the plans of the supported unit and anticipate the requirements for field artillery support.

c. The proper organization for combat, necessary changes thereto during the operation, and maximum feasible centralized control when appropriate.

d. Coordinated movement of field artillery units and proper disposition of units within march columns.

e. The selection of position areas from which effective fire can be delivered.

f. Continued reconnaissance for position areas, observation posts, locations for other installations, and routes.

g. Timely displacement of field artillery units to provide continuity of field artillery support.

h. Sound procedures for effecting relief of field artillery units in combat and for receiving attached field artillery.

i. Effective ground and air security measures coordinated with the overall security plans of the supported and adjacent units.

Section II. MARCHES

5–3. Tactical Marches

When a force is marching in several march columns, field artillery is placed in each column to insure its availability for early and adequate support of the security forces and the initial action of the main body. Field artillery may be attached to the main body during the march.

5–4. Air Defense Protection

Continuous air defense protection will be provided for the force. Air defense units will be deployed so as to provide air defense for march columns.

5–5. References

a. Field Manuals. Details concerning the basic doctrine governing troop movements are given in FM 100–5; technical and logistical data and march tables in FM 101–10–1; march orders in FM 101–5; motor movements in FM 55–30; protection by air defense artillery in FM 44–3 and FM 6–140.

b. STANAG No. 2041. The United States Armed Forces, together with other NATO Armed Forces, have concurred in the Details of Agreement of STANAG 2041, Operational Road Movement Orders, Tables and Graphs. The details of agreement are contained in FM 55–30 and FM 61–100.

Section III. SECURITY OF FIELD ARTILLERY

5-6. General

Initiative in the employment of security measures is necessary to maintain effective fires against an enemy strong in artillery and tactical air, or skilled in infiltration and guerrilla tactics. Deception contributes to effective security.

5-7. Movements

Secrecy in moving field artillery into position is gained by night marches and infiltration. Detailed staff planning, reconnaissance, and coordination are necessary to avoid confusion and delay.

5-8. Communications Security

The commander is responsible for the implementation and execution of sound communications security policies and procedures. He insures that personnel subordinate to him understand that US Army communications systems are vulnerable to enemy intercept, direction finding, and analysis techniques that are detrimental to the security of the unit. Essential elements of communications security are—

a. Net discipline.

b. Reduction of transmission time.

c. Strict adherence to Communication-Electronics Operation instructions (CEOI) and Communications-Electronics Standing Instructions (CESI).

d. Strict adherence to the use of approved codes only.

e. The use of authentication secure radio nets.

5-9. Deception Measures

Deception measures are taken in accordance with tactical cover and deception plans and are designed to support tactical operations. Deception measures are strictly controlled and must conform to the mission of the supported force and that of the higher headquarters.

a. Dummy positions are used to deceive the enemy as to the locations of field artillery units. These positions are constructed to appear as realistic as possible.

b. Many other deception measures may be taken. Field artillery may occupy a roving gun position. Registration, interdiction, or harassing fires by roving guns from surveyed positions are effective. Simultaneous firing by several units increases the enemy's difficulties in locating individual positions. Simulators may also be used for this purpose. Reduction of fires, elimination of preparations, restrictions on registrations, and radio and radar silence, or other restrictions on electronic operations help to conceal the presence and location of field artillery. Simulators may also be used for this purpose.

Section IV. POSITION AREAS

5-10. General

a. General. The selection of field artillery position areas is governed mainly by the mission, the terrain, the mobility of available weapons, the nature of the tactical operation, and the need for dispersion as a protective measure. Commanders may have to define areas for the locations of the major elements of their commands in order to coordinate the position areas with other requirements of the operation.

b. Priority. In nonnuclear warfare, the normal order of priority for field artillery positions is division, corps, and army field artilleries. However, special requirements of the force may dictate deviations from the normal priorities.

5-11. Responsibility

Field artillery commanders habitually coordinate position areas with the maneuver force commander. Commanders of direct support field artillery units normally select their own position areas but may be directed to occupy position areas designated or selected by the next higher field artillery commander. Position areas for general support-reinforcing units are selected by the force field artillery commander, who considers recommendations made by the reinforced commander. Position areas for reinforcing units are normally selected by the reinforced unit commander. Corps and army field artillery position areas within the division area are coordinated with the division field artillery commander concerned. Army field artillery position areas within the corps area are coordinated with the corps field artillery commander concerned.

Section V. DISPLACEMENTS

5–12. General

Planning for displacement is continuous. Displacement includes the reconnaissance, selection, and occupation of position (RSOP). Movement must conform to the plan of the maneuver force.

5–13. Responsibilities

Authority for displacement of field artillery units varies with the assigned tactical mission (fig 3–1 and 3–2). Timely and rapid displacement of field artillery units is necessary to support maneuver elements with continuous fire support. Continuous support is maintained by displacing units by echelon or by using other field artillery units to answer calls for fire during displacement. Displacement is completed as rapidly as possible in order to resume fire with minimum delay and to minimize the probability of enemy detection. When a nuclear attack is imminent, the area of displacement will be broadened and planning time will be decreased.

Section VI. RELIEF IN COMBAT

5–14. General

Relief in combat is of two general types—relief in place and passage of lines. During the relief, field artillery maintains its normal fires. When possible, relief is accomplished at night or by echelon to maintain secrecy. When a relief in place or a passage of lines is to be accomplished, warning orders are issued by the commander of the next higher headquarters and by the commanders of the relieving unit and the unit being relieved. The warning orders should include the time of the movement, the road priority, the zone of action of the relieving unit, and any control measures required to maintain secrecy.

5–15. Responsibilities

The field artillery unit being relieved is responsible for furnishing to the relieving unit the following information as needed:

a. Friendly situation to include unit and installation locations and locations of the no-fire line, O–O line, and observation posts.

b. All available information of the enemy to include target lists.

c. Route information and, if needed, road guides.

d. Survey information.

e. Locations of supply installations.

f. Location of other field artillery units within supporting range and means of communications with the units.

g. Fire or movement restrictions.

h. Existing wire circuits and wire line route maps.

i. Information necessary for fire control, including fire plans and situation maps.

j. Location of minefields.

k. Details pertaining to perimeter defense responsibilities and/or recommended defense posture.

5–16. Command

a. Relief in Place. The principle that only one commander is responsible for a particular operation must be adhered to in the conduct of a relief in place. When both the field artillery and the supported unit are relieved at the same time, the field artillery command passes from the relieved commander to the relieving commander at the same time that command is passed between supported commanders. When the field artillery and the supported unit are relieved at separate times, the field artillery command passes from the relieved field artillery commander to the relieving field artillery commander as agreed on by the two field artillery commanders, unless otherwise directed by higher headquarters.

b. Passage of Lines. During offensive ground combat operations when a relief by passage of lines is effected, command passes to the relieving field artillery commander before the passage of lines begins. The relieved field artillery may be attached to the relieving field artillery or may be ordered to reinforce from its original positions until the force supported by the relieving unit passes beyond range of the relieved field artillery.

c. Withdrawal to a Rearward Passage of Lines. Withdrawal actions frequently terminate in a rearward passage of lines. Liaison is established between the field artillery commanders of the withdrawing force and the force which is being

passed through. Information is exchanged, and plans are coordinated. Arrangements are made for the transfer of fire support responsibility for the sector. This transfer normally coincides with the passing of control of the sector from the withdrawing commander to the commander of the force being passed through. Fire plans are prepared and communication channels are established to permit the withdrawing force to receive field artillery support from the force being passed through during the critical phases of the withdrawal.

5-17. References

The United States Army, together with other NATO armies, has concurred in the details of agreement of STANAG 2082. The terms and details of agreement are included in appendix S.

Section VII. ATTACHMENT

5-18. General

The presence of additional field artillery in a combat area could be an indication of more active operations. Therefore, field artillery supporting a combat unit should move with utmost secrecy and during periods of reduced visibility.

5-19. Attachment to Other Field Artillery Headquarters

Field artillery units may be attached to other field artillery headquarters. The attached units are given orders similar to those given to assigned units. The orders to the attached units state their mission, position areas, and routes.

5-20. Attachment to Division Field Artillery Battalions

When a nondivisional field artillery battalion is attached to a division field artillery battalion, the commander of the division battalion is normally designated the battalion group commander. He is responsible for insuring that complete preparations are made to receive the attached battalion and for furnishing command guidance and control to the attached battalion to the same degree that he furnishes guidance and control to his own units.

Section VIII. FIELD ARTILLERY WITH SECURITY FORCES

5-21. General

A maneuvering military force provides protection by employing reconnaissance and security elements (covering forces) as advance, rear, and flank guards when necessary. Self-propelled and aerial field artillery are desirable for providing support to the security forces.

5-22. Covering Force

A covering force should be strong in field artillery. Planning and reconnaissance must be continuous to enable the field artillery to occupy positions promptly in support of an action. Field artillery with a covering force may be required to displace rapidly and frequently. It is positioned well forward to allow it to open fire at long ranges so that other elements of the covering force can protect it from surprise attack. Weapons of mixed calibers are employed to delay, deceive, deny, or destroy the attacking force and limit observation of friendly positions. Normally, radio communications are used and minimum survey is performed during such operation. Field artillery may be attached to covering forces when control by the parent headquarters will be difficult.

5-23. Advance Guard

Field artillery in support of the advance guard may be either attached or assigned a mission of direct support. If the advance guard is small and its area of operation can be covered effectively, support may be furnished by the field artillery supporting the main body. The amount of field artillery support depends on the mission and size of the advance guard and the expected enemy action. The position of the field artillery and the requirement for rapid entry into action are similar to those for field artillery in support of the covering force. When contact is imminent, field artillery supporting the advance guard moves by echelon from one firing position to another.

5-24. Rear Guard

Field artillery in support of the rear guard may be either attached or assigned a mission of direct support. The field artillery occupies positions close

behind each of the rear guard positions. Fire is opened early to force the enemy to deploy and thus delay his advance. Interdiction fire is placed on roads, road junctions, and key terrain features. When the rear guard is engaged, the supporting field artillery moves by echelon from one position to another.

5–25. Flank Guard

Field artillery in support of the flank guard may be attached, or support may be furnished by the field artillery supporting the main body. The employment of field artillery attached to the flank guard is similar to the employment of field artillery with the advance guard.

Section IX. AUXILIARY WEAPONS

5–26. General

When directed, the fires of auxiliary weapons are used to supplement field artillery fires. Weapons which may be used as field artillery are tanks and air defense artillery weapons that have a surface-to-surface fire capability, and attack helicopters which employ the same weapon systems as aerial field artillery.

5–27. Mission

a. Auxiliary weapons used as field artillery are best employed by assigning the unit equipped with the weapons a mission of reinforcing a field artillery unit, or by attachment to the field artillery unit.

b. The supporting unit is usually responsible for—

(1) Establishing communication and liaison with the reinforced field artillery.

(2) Providing its own logistical support.

c. The supported unit is usually responsible for—

(1) Providing a communications frequency upon which to operate.

(2) Providing fire direction personnel or equipment as required.

(3) Providing survey control as necessary.

d. When tanks are used to reinforce a field artillery unit, consideration must be given to the short tube life of tanks, and to the selection of a position that affords—

(1) Rapid return to mounted combat.

(2) Proximity to the supply routes.

Section X. ARMY AVIATION

5–28. General

The use of army aircraft provides the commander with a means of improving his operational and logistical capabilities and expediting his operations. For detailed discussion, see FM 1–100 and FM 6–102.

5–29. Capabilities

Army aircraft capabilities include, but are not limited to, performance of the following tasks:

a. Visual observation and target acquisition.

b. Adjustment of field artillery fire.

c. Area reconnaissance.

d. Route reconnaissance.

e. Control of maneuver elements.

f. Radio relay.

g. Liaison with adjacent units.

h. Message, map, and photography delivery.

i. Mapping and survey.

j. Radiological monitoring.

k. Column control of ground vehicles.

l. Command and staff transportation.

m. Damage assessment.

n. Emergency medical evacuation.

o. Delivery of critical supplies.

p. Delivery of critical personnel.

q. Aerial fire support (FM 1–100).

r. Tactical movement of field artillery units.

5–30. Aerial Field Artillery

The field artillery battalion, aerial field artillery, is organic to the airmobile division and is assigned to corps. It is designed to provide fire support, as required, to all maneuver forces throughout the airmobile division and corps areas of operations. Aerial field artillery may be employed as a battalion, but it is usually employed by battery,

platoon, or section. It normally is assigned a mission of general support or general support-reinforcing, with control maintained at division field artillery. Commanders contemplating the use of aerial field artillery should be thoroughly familiar with its capabilities and limitations. For a detailed discussion of aerial field artillery, see FM 6–102.

CHAPTER 6

FIRE SUPPORT COORDINATION

(NATO STANAG 2031, CENTO STANAG 2031, SEATO SEASTAG 2031, NATO STANAG 2047, CENTO STANAG 2047, ABCA QSTAG 110, NATO STANAG 2083, CENTO STANAG 2083, SEATO SEASTAG 2083, NATO STANAG 2099, CENTO STANAG 2099, SEATO SEASTAG 2099, NATO STANAG 2103, CENTO STANAG 2103, ABCA QSTAG 123, NATO STANAG 2104, CENTO STANAG 2104, ABCA QSTAG 130, NATO STANAG 2111, NATO STANAG 2014, CENTO STANAG 2014, SEATO SEASTAG 2014, ABCA QSTAG17R, ABCA QSTAG 47.)

Section I. GENERAL

6–1. Introduction

a. Fire support is the assistance to those elements of the ground forces such as infantry and armor units which close with the enemy; it is rendered by delivering field artillery fire, naval gunfire, and aircraft strafing and bombardment. Fire support coordination is the planning and execution of fire so that targets are adequately covered by a suitable weapon or group of weapons.

b. The principles of fire support coordination are compatible with the principles of war and support them accordingly. A detailed discussion of the principles of war is contained in FM 100–5.

c. Field artillery provides the Army with the expertise necessary to develop the doctrine and plans essential to the successful use of fire support in land combat operations (AR 10–6).

d. Combat power in the form of fire support is one of the principal resources available to the commander for influencing the outcome of battle and is the most responsive and flexible resource. The effectiveness with which the commander employs this resource in support of his plan of action may be decisive. The established principles of fire support coordination have not changed with the addition of nuclear and toxic chemical weapons and the extensive use of armed helicopters; however, available fire support is enhanced by the increased lethality and responsiveness of these weapons.

e. Fire support coordination procedures and the composition of fire support agencies must be flexible. No one system can be equally effective at all echelons at all times. Procedures to accomplish the tasks involved in the coordination of fire support will vary with the headquarters, the amount of fire support available, and the type of operation. This chapter provides general guidance for—

(1) Application of the principles of fire support coordination.

(2) Responsibilities of the fire support coordinator.

(3) Composition of fire support coordination agencies.

(4) Coordination between the fire support coordination agencies and other elements of the supported force.

(5) Attack of targets.

(6) Coordination of special ammunition.

(7) Coordinating and limiting measures.

f. The detailed organization and procedures of fire support coordination agencies should be included in the unit SOP.

6–2. Objective of Fire Support Coordination

a. The objective of fire support coordination is to provide the most effective fire support possible with the means available, to avoid duplication of effort, and to achieve complete integration of all fire support means in the scheme of maneuver or plan of defense.

b. Maneuver and fire support are interdependent, and their planning and execution must be coordinated.

c. Fire support coordination should provide assurance that all targets are adequately attacked by appropriate means.

Section II. PRINCIPLES AND RESPONSIBILITIES

6-3. Principles of Fire Support Coordination

The successful coordination of fire support on surface targets—whether planned in advance or in response to an immediate request—demands complete understanding of the basic principles of fire support coordination. These principles are discussed in *a* through *k* below.

a. Consider the Use of All Fire Support Available. The fire support coordinator (FSCOORD) or fire support officer (FSO) must consider the use of all fire support assets available to the force. These assets may be organic, assigned, attached, or in a supporting role. Capabilities and limitations of each type of fire support are considered with a view toward providing (determining) the most effective means, consistent with responsiveness, economy, and priorities. This requires that a concerted effort be made to use all fire support means and use them in a carefully coordinated manner, insuring that they support the force mission. Care must be taken to insure that their effects complement each other and that coordination procedures permit simultaneous employment of the various types of fire support to the maximum extent possible.

b. Furnish the Type of Fire Support Requested. The requesting agency is usually in the best position to determine immediate fire support requirements. Because of existing conditions (e.g., availability of ammunition, tactical considerations, and safety), it may not be practical to provide the type of fire support requested. However, the type of fire support specified in the request will serve as a basis for determining the type of fire support to be delivered.

c. Assign Fire Missions to the Agency Capable of Delivering the Most Effective Fire. Fire missions are assigned to, or requested of, the agency that can deliver the most effective fire, providing that agency can deliver the necessary fire within the required time.

d. Provide Rapid Coordination. Procedures must be established and practiced to effect rapid coordination in order to attack targets within the shortest possible time. Any agency that slows down the delivery of fire on a target may jeopardize the success of the entire force.

e. Use the Lowest Echelon Capable of Furnishing Effective Support. Fire support is furnished by the lowest echelon that has the necessary means available to accomplish the fire support mission. For example, if division artillery can neutralize a target with organic artillery means, it should do so without reference to higher headquarters.

f. Provide Safeguards to Friendly Troops, Vessels, Aircraft, and Installations. Providing safeguards to friendly troops, vessels, aircraft, and installations is a basic tenet of fire support coordination. Methods of safeguarding friendly elements are discussed in section V.

g. Use a Common System of Target Numbering. A common system of target numbering facilitates the effective use of all fire support means available. For example, if a commander or FSCOORD requests "ALL AVAILABLE, AF1010," all fire support agencies who have the target located will be able to identify it.

h. Avoid Unnecessary Duplication. Fire support resources should not be wasted by unnecessary "overkilling" of targets. However, economy should not be employed to the detriment of the mission.

i. Coordination at All Echelons. Fire support is coordinated at each echelon to the degree required by the mission. Final coordination is accomplished at the lowest echelon able to effect complete coordination of the mission.

j. Airspace Coordination. Because fire support requires major use of airspace, the fire support coordination process must include the necessary airspace coordination to reduce interference between the fire support and that of other airspace users.

6-4. Responsibilities of the Fire Support Coordinator

a. The force commander inherently has the final responsibility for all matters relating to fire support. He normally fulfills his responsibilities through his G3, who has the general staff responsibility for integrating fire support with combat operations. Coordination of fire support is usually

accomplished at the headquarters of the force commander.

b. A fire support coordinator is required at each echelon of command from maneuver battalion through field army. The FSCOORD, the senior field artillery officer at each echelon, is charged with the specific responsibility for coordinating all fire support on *surface* targets, whether planned targets or targets of opportunity, regardless of the source of these fires. Further, he has the responsibility for establishing and supervising the operations of the fire support element (FSE), or fire support coordination center (FSCC).

Section III. FIRE SUPPORT COORDINATION AGENCIES

6-5. General

All available types of fire support are coordinated at each echelon from company through field army. Procedures to accomplish the necessary coordination vary with the headquarters, the amount and type of fire support available, and the type of operation. However, any fire support coordination agency is required to—

a. Provide the commander with coordinated advice and recommendations to insure the most effective employment of available fire support means.

b. Resolve, to the limits of authority delegated by the commander, any fire support conflicts that arise during the planning and execution of the operation.

c. Insure prompt and effective attack of targets of opportunity.

6-6. Levels of Fire Support Coordination

Fire support coordination is accomplished at each echelon down to and including the maneuver company. An agency for fire support coordination, such as the fire support coordination center (FSCC) is established at maneuver battalion and brigade, and the fire support element (FSE) of the Tactical Operations Centers at division level and higher. Fire support coordination functions and responsibilities at all levels are as follows:

a. Maneuver Company. The company commander is responsible for fire support coordination at this level. Based upon his concept of the operation, the company commander, together with the platoon leaders and the field artillery forward observer, formulates a plan of fire support. Targets within the capabilities and ammunition availability of organic weapons, are assigned to these weapons. The company commander and the field artillery forward observer include the remaining targets in a fire support plan, consisting normally of a simple target list showing the location and description of the targets. The plan, (target list), is sent to maneuver battalion FSCC where the fire support officer (field artillery liaison officer), incorporates it into the battalion fire plan und advises the field artillery forward observer of the targets that have been approved.

b. Maneuver Battalion. At battalion level, fire support coordination is accomplished in the FSCC located at the maneuver battalion command post. The degree of formality in the functioning of the FSCC is determined by the maneuver battalion commander. Key personnel normally involved in the operation of the FSCC are as follows:

(1) The fire support officer (FSO), a liaison officer to the maneuver battalion from the field artillery battalion in direct support of the brigade.

(2) The infantry or armor heavy mortar platoon commander or his representative.

(3) The S3 air.

(4) The air liaison officer (ALO) from the Air Force/Marine Corps Tactical Air Control Party (TACP).

(5) A naval gunfire liaison officer (NGLO), if naval gunfire support is provided.

(6) Representatives of any other available fire support agencies as desired by the commander (to include the Redeye section leader).

c. Brigade. At brigade level, fire support coordination is accomplished in the FSCC located at the brigade command post. An example of a brigade FSCC is shown in figure 6-1. The degree of formality in the functioning of the FSCC is determined by the brigade commander. The commander of the field artillery battalion in direct support of the brigade is the FSCOORD. Because he cannot be present full time, he provides a fire support officer to function as the FSCOORD in his absence. Key personnel normally involved in the operation of the FSCC are as follows:

(1) The FSCOORD.

(2) The FSO, the liaison officer to the maneu-

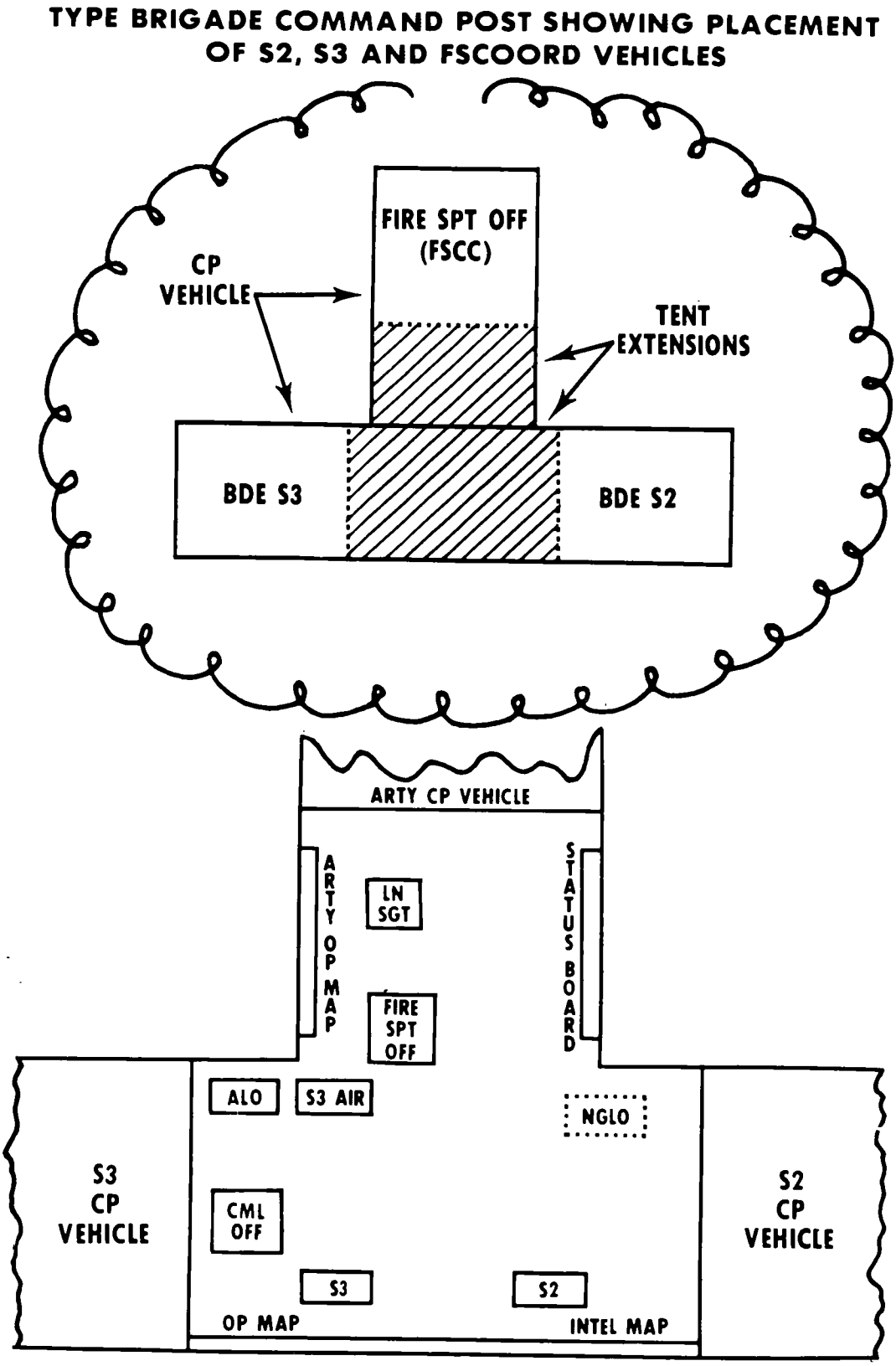


Figure 6-1. Example of a brigade command post showing the fire support coordination center.

ver brigade from the direct support field artillery battalion.

(3) The brigade S3 air.

(4) The ALO from the Air Force/Marine Corps TACP.

(5) The brigade chemical officer.

(6) A naval gunfire liaison officer, when appropriate, and representatives of other fire support agencies as desired by the commander.

(7) The personnel of the brigade airspace control element (BACE). The BACE, when formed, is collocated with the FSCC. Examples of coordination performed between the FSCC and BACE are found in FM 44–10 (Test).

d. Division and Higher Levels. At the division and higher levels of command, a more formal agency is established for fire support coordination purposes. At division, corps, and field army levels, the agency charged with fire support coordination is the fire support element (FSE). The FSE is one of several elements that constitute the tactical operations center (TOC).

Section IV. TACTICAL OPERATIONS CENTERS

6–7. General

a. Definition. A tactical operations center (TOC) is a facility within which are grouped representatives of general and special staff sections concerned with current combat and combat support operations. These representatives assist the commander in executing current operations by providing information of tactical operations and available combat support and combat services support. They make recommendations for command decisions, take action in accordance with established policies, and issue implementing instructions.

b. Composition. The exact size and composition of the TOC vary according to the level of command and the combat support and combat service support means available to the command. Each TOC can be established and operated with organic equipment. No special equipment or facilities are required.

c. Purpose. The TOC is designed as a fast-reacting, flexible assembly of key personnel expressly concerned with conducting current operations. The purpose of the TOC is to respond to situations which develop during the battle in progress. Instant response is possible because the elements that constitute the TOC are relieved of the burden of routine functions and future planning. The force commander may delegate to key members of the TOC the authority to execute the functions of direction, control, coordination, and integration of current tactical operations and current combat support and combat service support operations. The G3 is normally assigned the primary general staff responsibility for supervision of the TOC. The deputy corps field artillery commander may serve as the corps field artillery commander's senior representative in the corps tactical operations center (CTOC).

6–8. Elements of a Typical Tactical Operations Center

a. General. The elements of the TOC are provided by general and special staff sections concerned with immediate operations. Each element is supervised by a chief, who represents the principal staff officer of his respective staff section. The basic rules of staff relationships apply to the TOC. Unity of effort is essential.

(1) Each parent staff section handles all normal routine functions and screens all information to insure that its TOC element is not burdened with unessential details or information.

(2) Appropriate procedures must be established for timely exchange of information between each parent staff section and its TOC element and should be included in the standing operating procedures.

(3) All elements of the TOC except the fire support element (which is discussed in paragraph 6–9) and other representatives that are assigned to the TOC, as required, are discussed below. For additional information regarding elements of the TOC, see appendix J, FM 101–5.

b G2–G3 Elements. The G2–G3 operations elements are the nucleus of the TOC. For ease of operation, the operations elements of the G2 and G–3 staff sections must be collocated in the TOC. Figure 6–2 shows how they may be located.

(1) *G2 element.* The G2 element is the focal point for intelligence pertaining to the current situation. Many intelligence missions originate in the G2 element and are passed to the headquarters G2 section for incorporation in the overall G2 collection plan. The intelligence missions may be passed directly to the collection agencies. The chief of the G2 element is responsible for coordi-

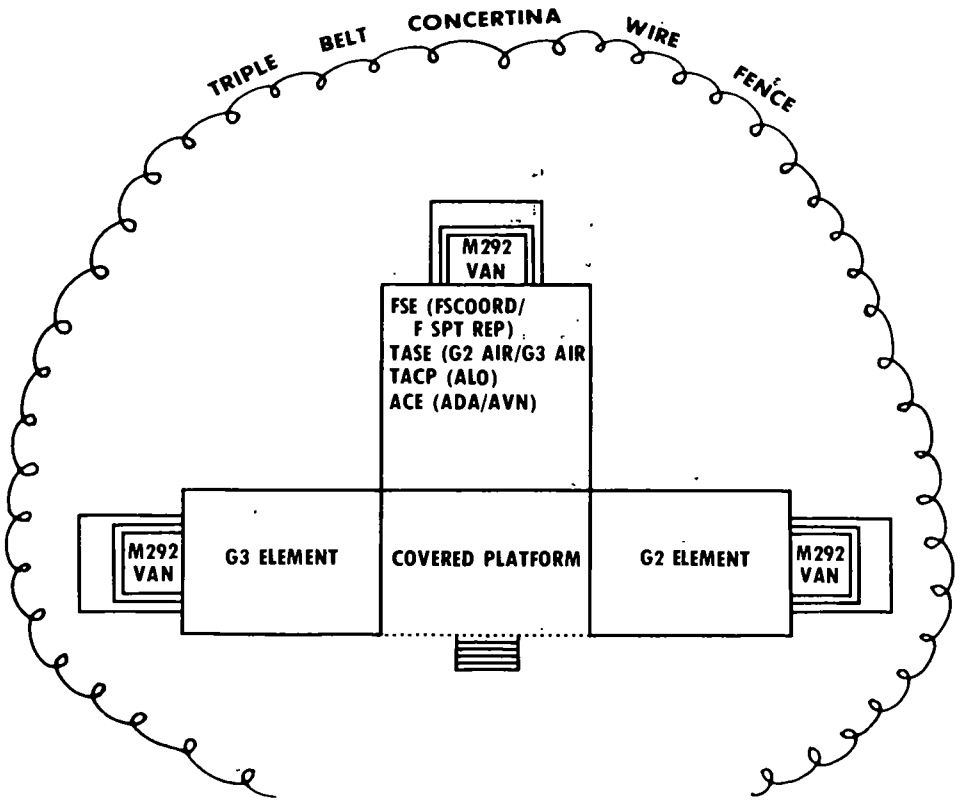


Figure 6–2. Part of a type tactical operations center showing the physical positioning of the G2–G3 elements, the fire support element, the tactical air support element, and airspace coordination element.

nating the preparation of intelligence annexes, estimates, and summaries for use in current operations.

(2) *G3 element.* The headquarters G3 section provides the G3 element with information required to coordinate tactical operations with combat support and combat service support in the TOC. The chief of the G3 element is responsible for coordinating the preparation of operation orders and directives. He is responsible for making recommendations to the G3 on the employment of combat and combat support means. His recommendations are prepared in conjunction with the G2 element and are coordinated with other affected TOC elements.

c. G1–G4 Representation and other Temporary TOC Elements. A TOC may include representatives from the G1 and G4 sections, as required, and additional temporary elements on an as-required basis. These requirements are normally in situations in which the functions of these representatives and the temporary elements, while in the TOC, are of more than routine importance to the current tactical mission. G1 and G4 representatives advise TOC elements on personnel and logistical support status and capabilities. Also, they inform the general staff officers whom they represent of all significant developments and probable requirements for personnel and logistical support. These representatives, when present, are normally stationed within the G2–G3 elements. When the chemical, biological, and radiological element (CBRE) is required, it is organized by consolidating the chemical, biological and radiological functions, and the chemical personnel from the G–3 Element and the fire support element within the TOC (FM 101–5).

d. Electronic Warfare Element. The electronic warfare element (EWE) coordinates information and furnishes advice on the capabilities and limitations off electronic warfare; evaluates the supported command's intelligence requirements in terms of Army and supporting element signal intelligence (SIGINT) and EW capabilities; and serves as the point of entry into the TOC for SIGINT and EW information.

e. Airspace Control Element. The primary function of the airspace control element (ACE) is control of the use of airspace over the command area. The element serves as a source of information for the current status of air defense and Army avia-

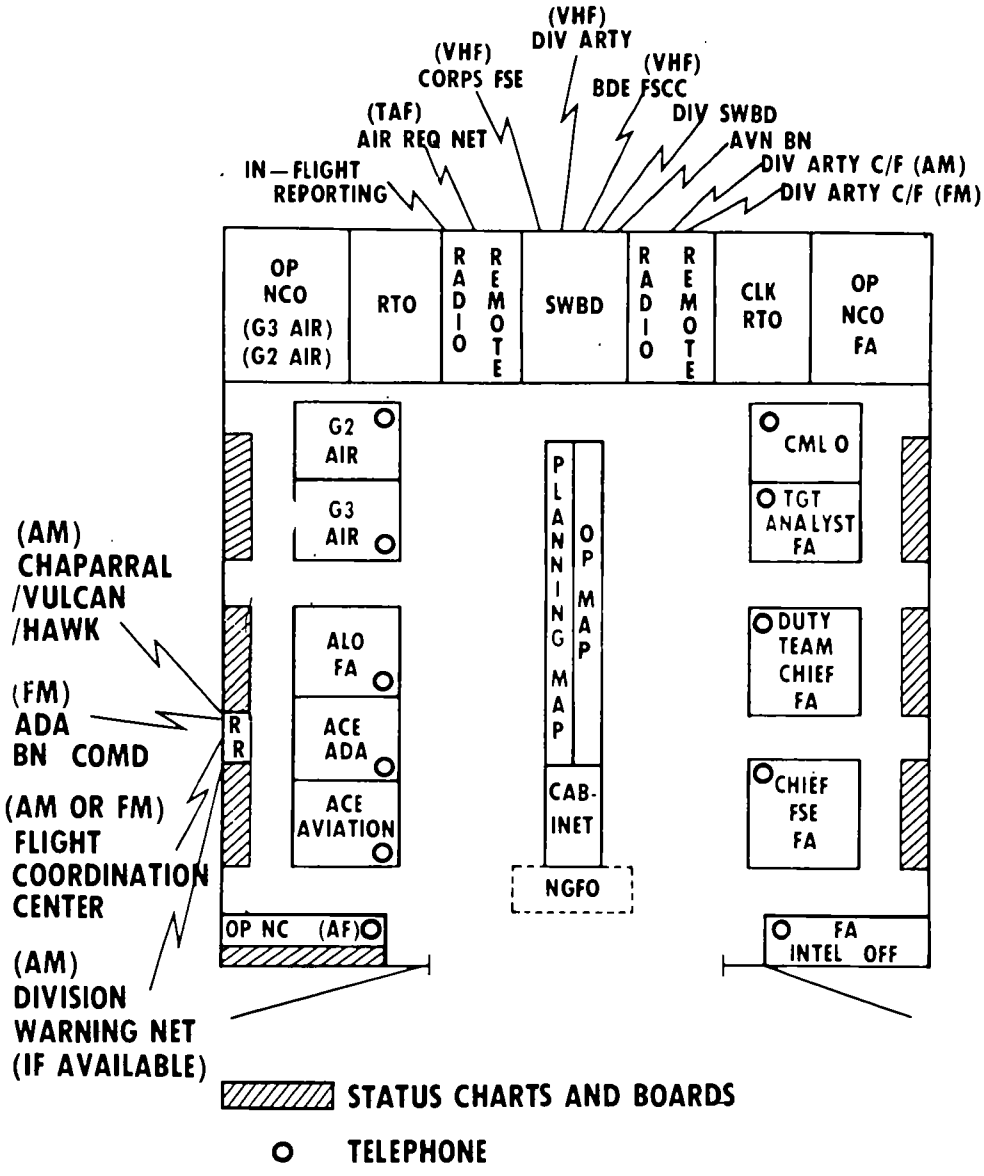


Figure 6–3. Example of collocation of FSE, TASE, and ACE representatives.

tion capabilities. The FSCOORD coordinates with the ACE concerning fire support requirements for airspace and the allocation of Army aviation. This element is normally collocated with the fire support element (FSE).

f. Tactical Air Support Element. The tactical air support element (TASE) consists of the G2 air, the G3 air, and representatives of the tactical air force. This element serves as a central facility through which requests for tactical air support are coordinated and integrated with current operations. To facilitate coordination, the TASE is normally collocated with the fire support element as shown in figure 6–3.

6–9. Organization and Functions of the Fire Support Element

The primary function of the fire support element (FSE) is to provide coordination of fire support on surface targets, as required, to support most effectively the plan of operation. Under the staff supervision of the assistant fire support coordinator (Chief, FSE), the FSE provides a central facility through which the force commander's policies for employing fire support are implemented and within which plans for fire support and fire support requests are processed and initiated. Field artillery fire planning channels are shown in figure 6–4. Field artillery fire request channels,

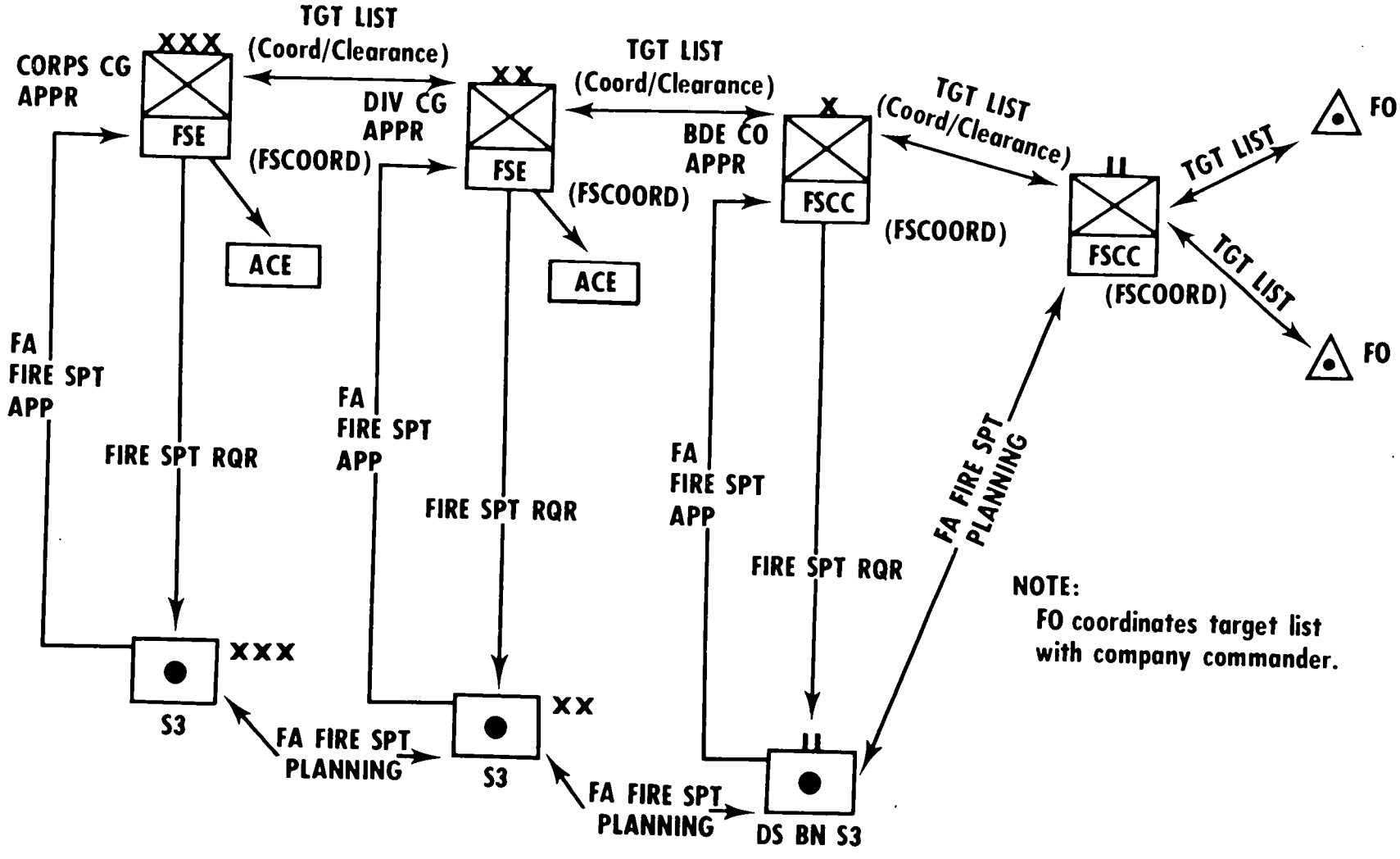


Figure 6–4. Processing channels for the field artillery fire support appendix, target list (coord/clearances).

tactical air request channels, and naval gunfire request channels are shown in figures 6–5, 6–12, and 6–13.

a. Field artillery personnel and equipment for the FSE are authorized in tables of organization and equipment, headquarters and headquarters battery, division/corps field artillery, and the field artillery section of the army headquarters company. Other required representatives are provided by the force headquarters staff and from other services as required (e.g., chemical target analyst, naval gunfire liaison officer). Key personnel authorized for the FSE by division/corps TOE are as follows:

Division	*Corps*
Assistant FSCOORD (LTC)	Assistant FSCOORD (COL)
Assistant FSCOORD (MAJ)	Two duty team chiefs (MAJ)
FA intelligence officer (MAJ)	Two FA intelligence officers (CPT)
Two target analysts (CPT)	Two target analysts (CPT)

b. Additional functions of the FSE include:

(1) *Maintains current status and capabilities of fire support resources.* The FSE insures that the commander's guidance relating to fire support is executed and the plan of operation is effectively and economically supported. Execution of this activity requires the FSE t o maintain current status and capabilities of all fire support resources available to the command for attack of surface targets. Related elements of the TOC are kept informed as to fire support status and capabilities.

(2) *Maintains the fire support situation map.* Maintenance of a fire support situation map depicting locations of fire support resources and the tactical situation enables the FSE to assess the situation rapidly, and to determine fire support units or resources capable of delivering fire on designated surface targets.

(3) *Coordinates fire support on surface targets.* During tactical operations, the FSE coordinates all fire support on surface targets delivered by resources available to the command. The FSE—

(*a*) Prepares the fire support portion of the operation order to include the fire support annex. The FSE insures that all fire support on surface targets is integrated by reviewing the component fire support appendixes (e.g., field artillery, air, air defense artillery (fire support role), naval gunfire, nuclear, and atomic demolition munitions (ADM) used in the barrier and denial plan.

(*b*) Coordinates with the ACE on field artillery and naval gunfire requirements for airspace and allocation of air defense and Army aviation fires on surface targets, and within the G3 element for coordination with the barrier plan and use of ADM.

(*c*) Receives requests from subordinate units for fire support, evaluates the request in light of other fire support requirements, and the fire support resources available; makes decisions within delegated authority to furnish requested fire support, substitutes other types of support for that requested, or disapproves the request.

(*d*) Designates fire support means for attack of targets as required.

(4) *Recommends correct fire support coordination measures.* To enable the FSE to coordinate fire support on surface targets, and to process requests for fire support means, the FSE remains abreast of the situation and of current fire support coordination measures to include boundaries, fire coordination line, fire support coordination line, and no-fire line as appropriate. It also maintains the status of free-fire plans, when applicable. Additional coordination measures and changes to existing measures are recommended.

(5) *Recommends targets to be attacked with nuclear weapons.* Based on target intelligence from the G2 element and from field artillery resources, the FSE evaluates surface targets to determine those suitable for nuclear attack. Targets considered suitable are analyzed to determine tentative method of delivery, desired ground zero, yield/height of burst, expected results, and prediction of fallout. The result of the analysis is submitted as a recommendation to the G3 element. Before a target is attacked, the FSE provides timely warning to subordinate, adjacent, and own next higher headquarters and naval and air forces that are likely to be affected by the strike. When a target is attacked, the FSE coordinates the necessary poststrike reconnaissance to ascertain actual damage resulting from the strike and informs other TOC elements as to the results. Target analysis and damage assessment are made on a continuing basis, regardless of the level of intensity in the use of nuclear weapons. Division special ammunition processing phases are shown at figure 6–6.

(6) *Recommends employment of chemical agents.* In accordance with established policies and directives, the FSE recommends the employment of chemical agents. Targets are analyzed by the chemical officer to determine their vulnerabil-

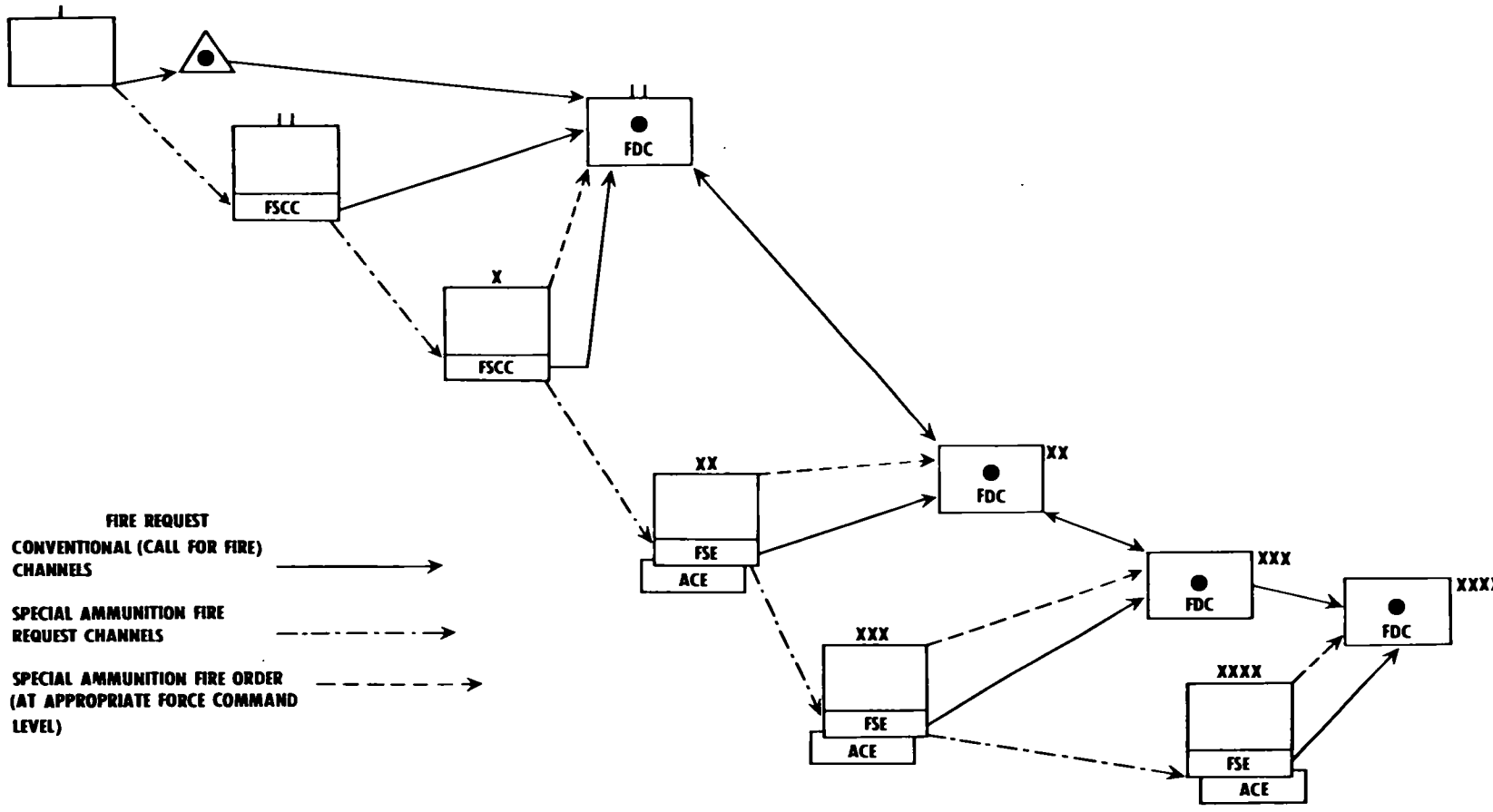


Figure 6–5. Artillery fire request channels.

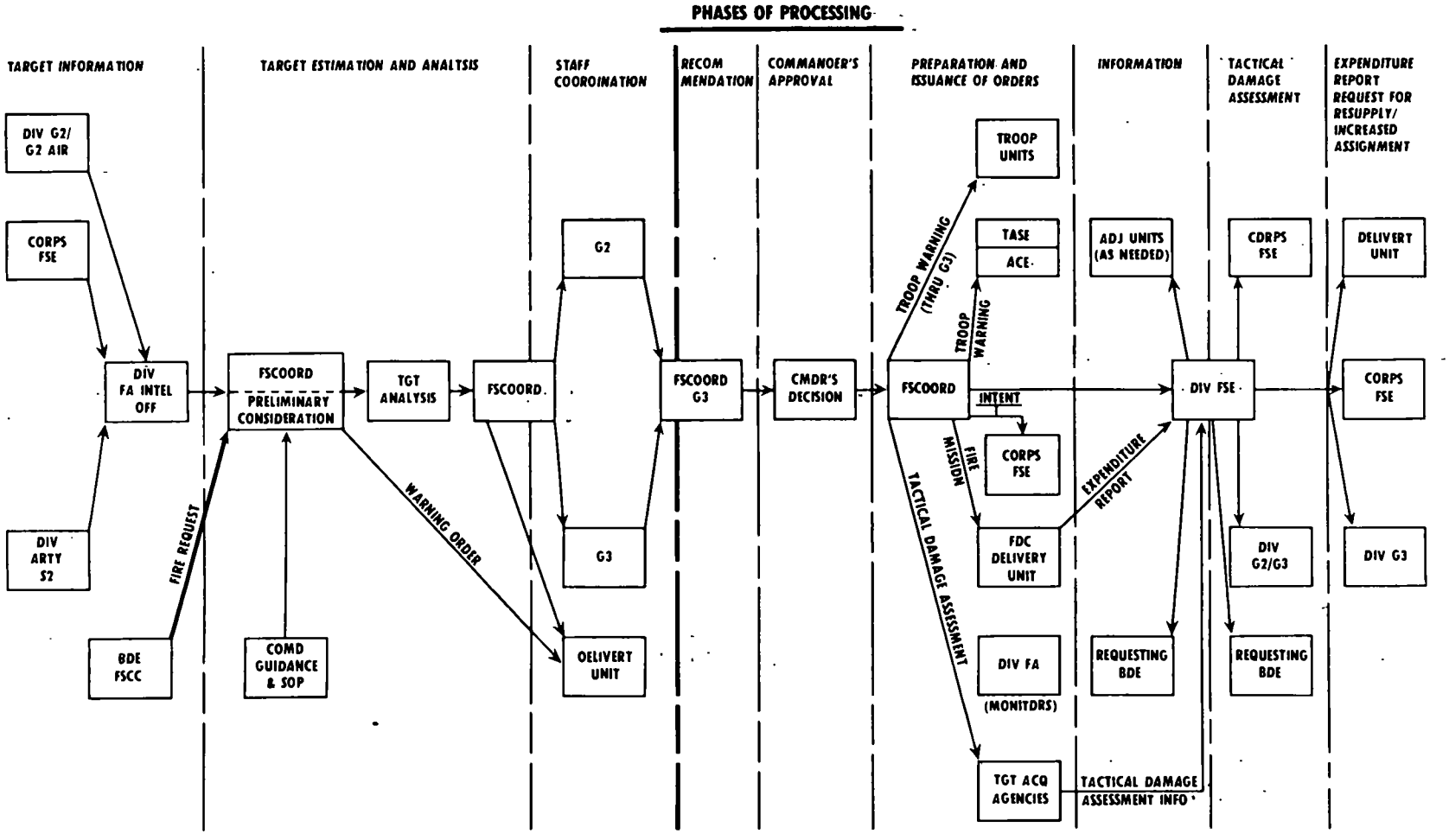


Figure 6–6. Division special ammunition processing phases.

ity to chemical agents. The FSE submits the results of the analysis to the G3 element and includes recommendations as to the type of agents, amount, form of agents, time of attack, and delivery means to employ.

(7) *Recommends allocation and reallocation of fire support resources.* Based on the commander's concept of the operation and missions assigned to subordinate commands, the FSE recommends allocation of available fire support resources for the attack of surface targets. As changes in the situation occur, the element reexamines all considerations and recommends reallocation as deemed necessary.

(*a*) Recommends the field artillery organization for combat.

(*b*) Recommends the special ammunition allocation, and assignment, and special ammunition load.

(*c*) Initiates and coordinates requests for additional fire support as required.

(*d*) Duties of the individual members of the FSE are outlined in appendix U.

Section V. FIRE SUPPORT COORDINATING AND LIMITING MEASURES

6–10. General

To facilitate rapid coordination and to insure that safeguards to friendly troops, vessels, aircraft, and installations are provided, the FSCOORD employs various coordinating and limiting measures. The most common of these measures are discussed in paragraphs 6–11 through 6–21. Some of the measures are illustrated in figure 6–7.

6–11. Zone of Fire

An area within which a designated field artillery unit or fire support ship delivers, or is prepared to deliver fire support is called a zone of fire. Zones of fire are assigned to field artillery and naval gunfire support units for control of fire laterally and in depth. The range limits within which a unit must be able to fire may be designated by minimum and maximum range lines. Zones of fire are either inherent in the assigned tactical mission or are designated upon assignment of the tactical mission.

6–12. Boundaries

Boundaries are used to designate the geographical area for which a particular unit is responsible. Within his own boundaries, unless otherwise restricted, a maneuver unit commander enjoys complete freedom of fire and maneuver. No unit may fire across boundaries unless such fires are coordinated with the unit to whom the area is assigned, or unless such fires are beyond the no-fire line or other appropriate coordination measure of the affected unit. The restriction applies to conventional ammunition and to special ammunition and their effects. When the fires employed by one force, to include smoke missions, affect safety in the zone of an adjacent force, coordination must be effected with the adjacent force.

6–13. No-Fire Line

a. Definition. A no-fire line (NFL) is a line short of which field artillery units or ships may not fire except on request or approval of the supported commander, but beyond which they may fire at any time within the zone of the supported unit without danger to friendly troops. Fires on targets beyond the NFL and short of the fire support coordination line (FSCL) are restricted to units of the corps which establishes the FSCL. (See paragraph 6–14 for details for the FSCL.)

b. Purpose. To expedite the attack of targets beyond the NFL without coordination with the maneuver commander in whose zone of action targets are located.

c. Applicability. The no-fire line is applicable to conventional and improved conventional ammunition delivered by field artillery and naval gunfire support ships for the safety of troops on the ground.

d. Establishment. The brigade or comparable sized maneuver unit commander is responsible for selecting or approving a recommended NFL location as it relates to his zone of action, while supporting field artillery commanders and field artillery fire support officers at every echelon should make appropriate recommendations concerning its location. The location of the brigade's NFL is forwarded up the chain of command through both field artillery and fire support coordination channels. These are then successively approved or modified, and a consolidated NFL is established for the zone of action of division and subsequently corps.

e. Location. The selected location of the NFL is based on such factors as the scheme of maneuver, patrol plans, location of security forces, and the

troop safety desires of the maneuver commander. There is no requirement for it to be located on identifiable terrain.

f. Dissemination. Initial and subsequent locations of the NFL are disseminated through the various fire support coordination agencies and fire direction centers to maneuver units and supporting arms concerned.

g. Graphical Portrayal. The location of the no-fire line is graphically portrayed on maps, charts, and overlays by a dashed red line with letters "NFL" followed by the establishing headquarters in parentheses above the line and the effective date-time group below the line.

h. Methods for Firing Short of the No-Fire Line. Fires delivered short of the NFL must be requested or approved by the supported commander or his designated representative in whose zone of action the target is located.

(1) All calls for fire, including those short of the NFL, which are initiated by forward observers of direct support battalions or NGF spotters of direct support ships, are monitored by liaison officers in the maneuver battalion FSCC. These calls for fire are coordinated with, or requested by, the maneuver company or battalion prior to transmission of the fire request and seldom require additional coordination or clearance. The FSCC or fire direction center can cancel the mission and/or require or initiate additional coordination if there is any doubt regarding the effect on adjacent units or troop safety.

(2) Missions short of the NFL which are initiated by other than the supported unit, such as the direct support field artillery battalion forward observers, or direct support ship naval gunfire (NGF) spotters, or countermortar radar, or general support fie'd artillery air observers, must be cleared by the supported unit commander concerned. The supported commander normally delegates authority to clear such fires in his zone of action to his FSCC and direct support field artillery battalion FDC, as appropriate. This delegation of authority assists in achieving a rapid attack on targets of opportunity.

6–14. Fire Support Coordination Line

a. Definition. A first support coordination line (FSCL) is a line, established by a force commander and coordinated with his appropriate supporting commanders, forward of which all forces may attack targets without danger to, or coordination with, the establishing force.

b. Purpose. The FSCL takes the place of a bomb line and supplements established NFL's. It facilitates the attack of targets by the tactical air force means and by special weapons in that portion of the establishing commander's zone of action beyond the FSCL, without coordination, provided those fires or unacceptable effects thereof do not fall short of the FSCL.

c. Applicability. The FSCL is applicable to all fire support not under the control (direction) of the establishing commander (i.e., systems employed by other services, nations, and higher echelons).

d. Establishment. The FSCL is established by the appropriate ground (normally, corps) commander and coordinated with appropriate supporting commanders or their representatives. The FSCOORD is responsible for submitting a coordinated recommendation to the establishing maneuver commander concerning the location of the FSCL.

e. Location. To enable recognition from the air, the FSCL should be located on identifiable terrain. It should be located a short distance beyond the area into which the establishing commander intends to send patrols or penetration forces (including airmobile forces), or in which he intends to maintain security forces. When detached forces are deployed beyond the FSCL in the zone of action of the establishing commander, that commander must establish another FSCL or other coordination measures to encircle the detached forces.

f. Dissemination. The location of the FSCL is disseminated by the establishing commander's fire support coordination agency to the fire support coordination agencies of subordinate, adjacent, and higher headquarters as required. It is further disseminated at each level of command, including the establishing command, to all concerned air and other fire control agencies such as the direct air support center, tactical air control center, fire direction center, supporting arms coordination center, and naval gunfire support ships.

g. Graphical Portrayal. The location of the FSCL is graphically portrayed on fire support maps, charts, and overlays by a solid black line with the letters "FSCL" followed by the establishing headquarters in parentheses above the line and the effective date-time group below the line.

h. Method for Firing Short of the FSCL.

(1) Fires delivered short of the FSCL must

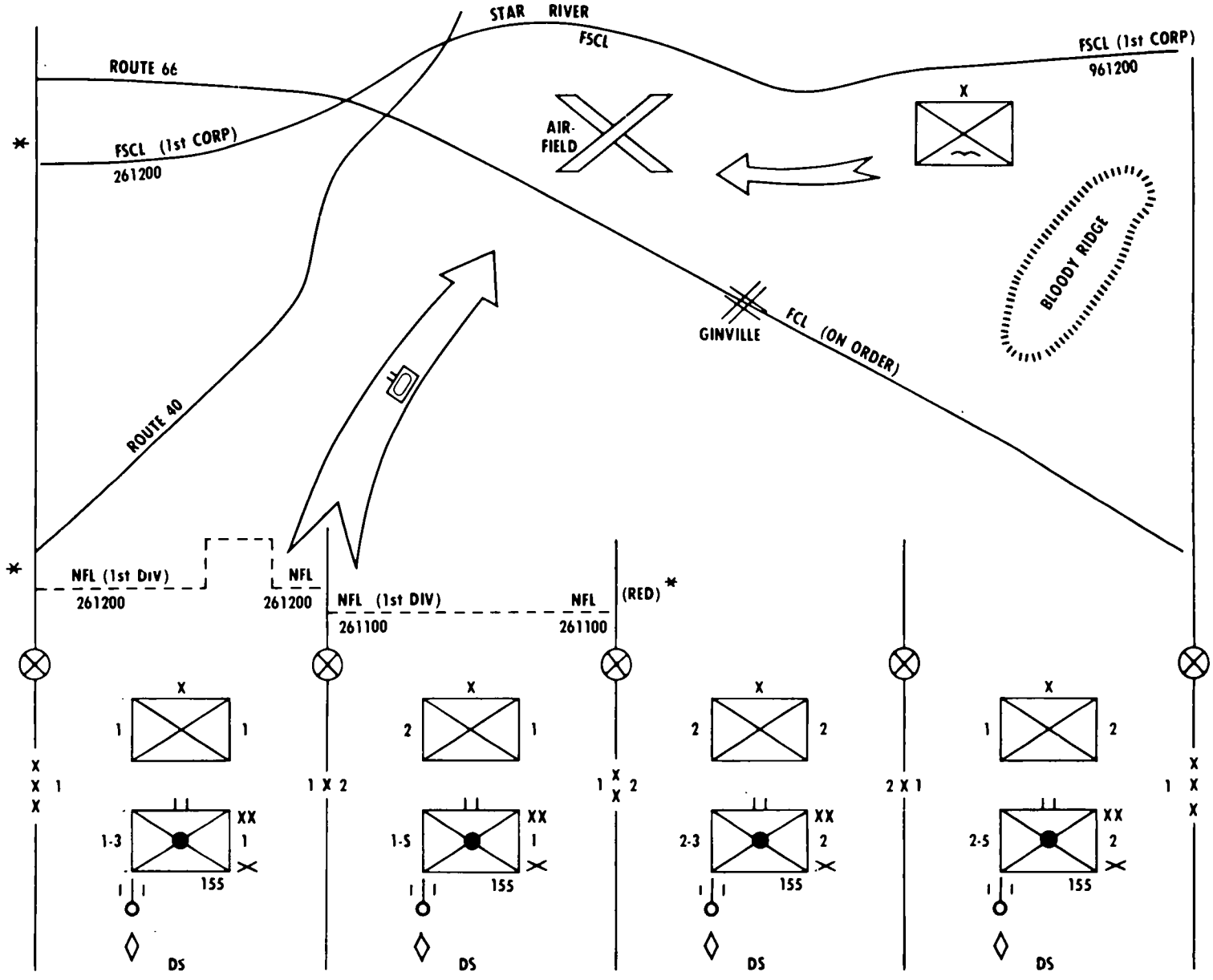


Figure 6–7. Coordination and limiting measures.

be coordinated with the unit in whose zone the target is located, unless an existing NFL or other coordination measure obviates the requirement for coordination. Requests by a unit subordinate to the corps for air support, additional field artillery, or additional naval gunfire support on a target short of the FSCL and within its own boundary are coordinated and processed through normal fire direction or fire support coordination channels. These normal processing procedures obviate the necessity for further coordination by the delivery unit.

(2) The air strikes initiated by the air force, naval air, or marine corps air short of the FSCL must be coordinated with the corps headquarters through the DASC. Similar procedures apply to naval gunfire or field artillery fires initiated by agencies/units external to the corps when such fires are to be delivered short of the FSCL, and an NFL for the area concerned is not in effect. Such field artillery or naval fires must be coordinated with the corps FSE.

6-15. Fire Coordination Line

a. Definition. A fire coordination line (FCL) is a line established to coordinate fires between helicopterborne or airborne forces and link-up forces, or between any converging friendly forces.

b. Purpose. The purpose of the FCL is to regulate all fires occurring between converging friendly forces.

c. Applicability. The fire coordination line is applicable to conventional and special ammunition delivered by any means.

d. Establishment. The FCL is established by the common commander of the converging forces.

e. Locating. To provide for recognition by all fire support agencies' fires, the FCL should be located on identifiable terrain. In link-up operations, the FCL is moved as close as possible to the stationary force to allow maximum freedom of action of maneuver and fire support of the link-up force.

f. Dissemination. The location of the FCL is disseminated by the establishing commander's fire support coordination agency to the fire support coordination agencies of subordinate, adjacent, and higher headquarters as required. It is further disseminated at each level of command, to include the establishing command and all concerned fire control agencies.

g. Graphical Portrayal. The location of the FCL is graphically portrayed on fire support maps, charts, and overlays by a solid red line with the letters "FCL" followed by the establishing headquarters above the line and effective date-time group below the line.

h. Method of Firing Beyond the FCL. Fires may not be delivered beyond the FCL without coordination with the affected force. Additionally, fires with effects extending across the line must be cleared with the force on the other side of the line before firing.

6-16. O-O Line

The O-O line is a line established by the corps field artillery commander as a means of coordinating field artillery target search in depth. Usually, the frontline division artilleries conduct target search short of the O-O line, and corps field artillery searches beyond it; however, this arbitrary division of responsibility does not restrict the zones of observation or attack of targets. The O-O line should be easily identifiable by terrain features. Its location is changed as dictated by the situation.

6-17. Restrictive Fire Plan

As a safety measure for friendly aircraft on air support missions, a restrictive fire plan (figure 6-8) may be imposed. A restrictive fire plan establishes a three-dimensional area (corridor/lane) that is reasonably safe from friendly surface-delivered nonnuclear fires. Restrictive fire plans should be used only when the risk to friendly aircraft is great enough to justify the attendant loss of surface-delivered fire support. For certain operations, a series of restrictive fire plans may be established, as in helicopter approach and retirement lanes. The FSCC at maneuver battalion provides a means of coordination that normally precludes the necessity for using restrictive fire plans. Through his FSCOORD, the commander has positive control over, or knowledge of, surface fire support agencies being employed in his area of operations. Through the TACP, the commander has positive communications with Air Force aircraft. With these means readily available, the commander can impose trajectory limitations, and shift or check fire surface fire support altogether whenever friendly aircraft may be endangered. Requests for restrictive fire plans are normally approved by the division

FSE which also disseminates the fire plans. The field artillery fire direction centers also disseminate restrictive fire plans and other trajectory limitations to higher, lower, and adjacent field artillery fire direction centers to insure receipt. The vital information normally disseminated includes minimum and maximum altitudes, length (by two coordinate points), width (on either side of a centerline) and the effective date-time group for commencement and termination; for example, Plan BOZO, altitude 500 feet to 3,000 feet, coordinates 57429392 to 59109545, width 500 meters, effective 281400 to 281410.

6–18. Free Fire Area

A free-fire area is a specific, designated area into which any fire support means may deliver fires against known or suspect targets without any coordination between the force requesting and/or delivering the fires and the agency that established the free-fire area. The force staff determines the need for a free-fire area, based on the enemy dispositions and current tactical situation, and then recommends to the commander the area to be designated a free-fire area. Preferably the area should be easily identifiable from the air; however, it may be designated by the use of grid lines. The force commander then requests approval of the recommended area from the commander (official) exercising jurisdiction in the area. Upon approval of the request, the designated area is declared clear for firing without further coordination. In approving the recommended area, the responsible commander (official) may designate portions of the area as no-fire areas and/or fire coordination areas. Normally, the commencement and termination times of the free-fire area are specified by a date-time group. The force commander then directs that the geographical limits and effective date-time group of

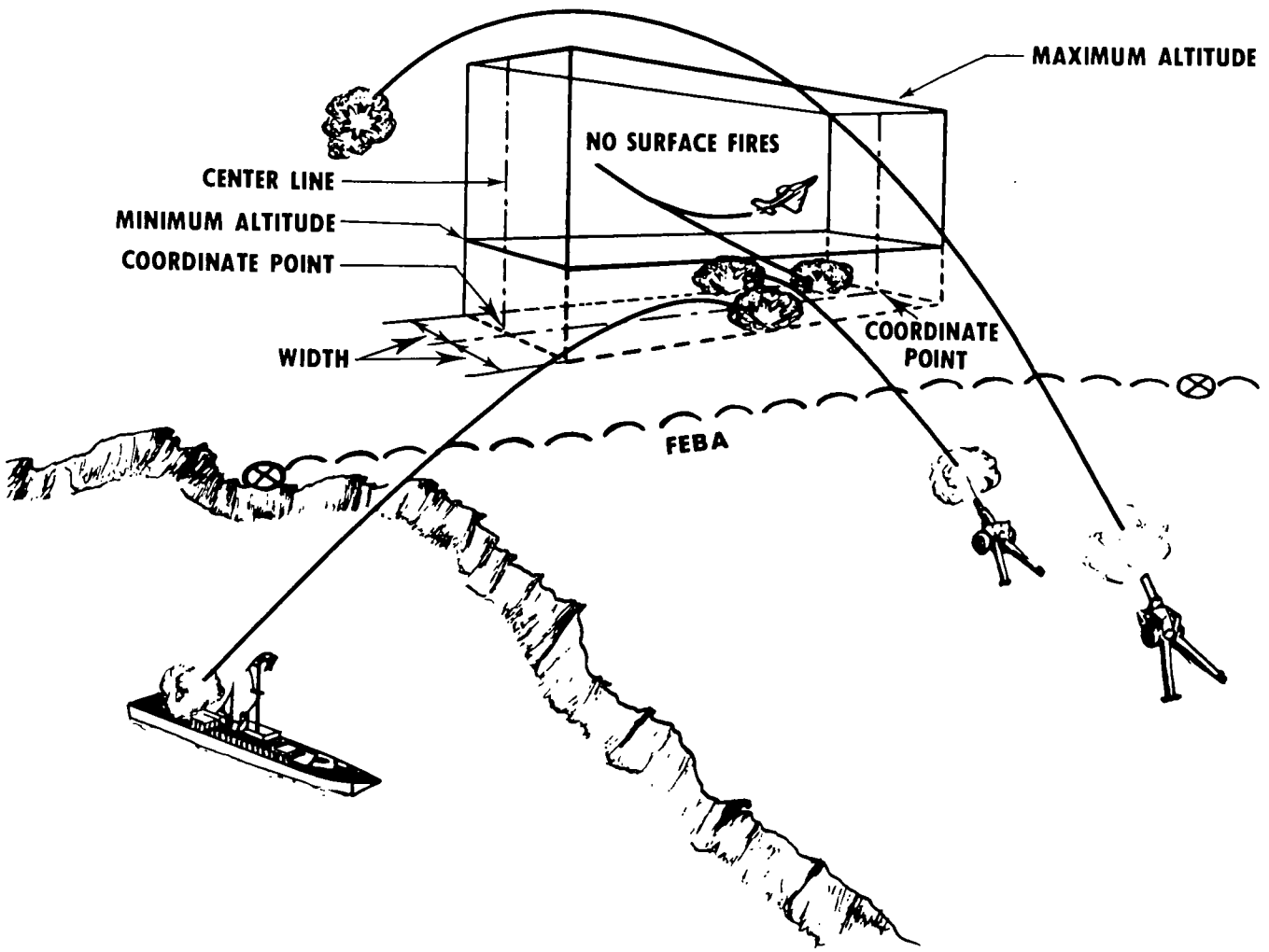


Figure 6–8. Restrictive fire plan.

the area be disseminated to his subordinate units. On a fire support map or overlay, the area is outlined in black and the words "free-fire area" and the effective date-time group are written inside the circumscribed area (figure 6–9). The area may also be identified by the designation of the headquarters that established the area; e.g., 2d Allied Corps. Units are authorized to fire into this area without further coordination with the force headquarters(commensurate with any coordinating instructions). For example, the free-fire area may be used by tactical air as a target or jettison area, by field artillery units for supporting fires, or by armed helicopters and/or aerial field artillery for reconnaissance by fire.

6–19. No-Fire Area

a. A no-fire area is a specific, designated area into which no fire support means will deliver fires and into which no effects from their fires will extend. The two exceptions to this rule are as follows:

(1) When the establishing agency requests or approves fires (temporarily) within the no-fire area on a mission basis.

(2) When an enemy force within the no-fire area is engaged with US (Allied) forces and, in the opinion of the commander, is a major threat to the security of the forces and there is not enough time to obtain approval from the establishing agency for fire into the no-fire area. At such a time, the commander will engage the enemy to defend his force.

b. A typical no-fire area is one established by the host country member (the authority in the area) for the protection of a friendly civilian populace from friendly fires within a US (Allied) tactical area of operations or area of responsibility. Upon arrival in the area of operations, the US (Allied) force commander effects liaison and coordinates the locations of no-fire areas with the host country member. The locations, designations, and effective date-time groups of the areas are then transmitted to all units of the force. The established areas should be readily identifiable from the air but may be designated by the use of grid lines. On a fire support map or overlay, a no-fire area (figure 6–10) is outlined in red, and red diagonal lines are drawn through the enclosed area. The words "no-fire area" are written inside the circumscribed area, along with the effective date-time groups for commencement and termination. The area should also be identified by the designation of the headquarters that established the area; e.g., 2d Allied Corps. All no-fire areas should be inserted in the gun direction computer (FADAC) and placed on maps and charts as appropriate to insure safety in the delivery of fires. No-fire areas may and do change as time passes and the situation changes. The force commander is informed of these changes through constant liaison with the host country member. Identification of no-fire areas and any changes thereto are transmitted to the units of the force. During the initial liaison and any subsequent liaison between the US (Allied) force commander and the host country member, it is constantly emphasized that any *specific*

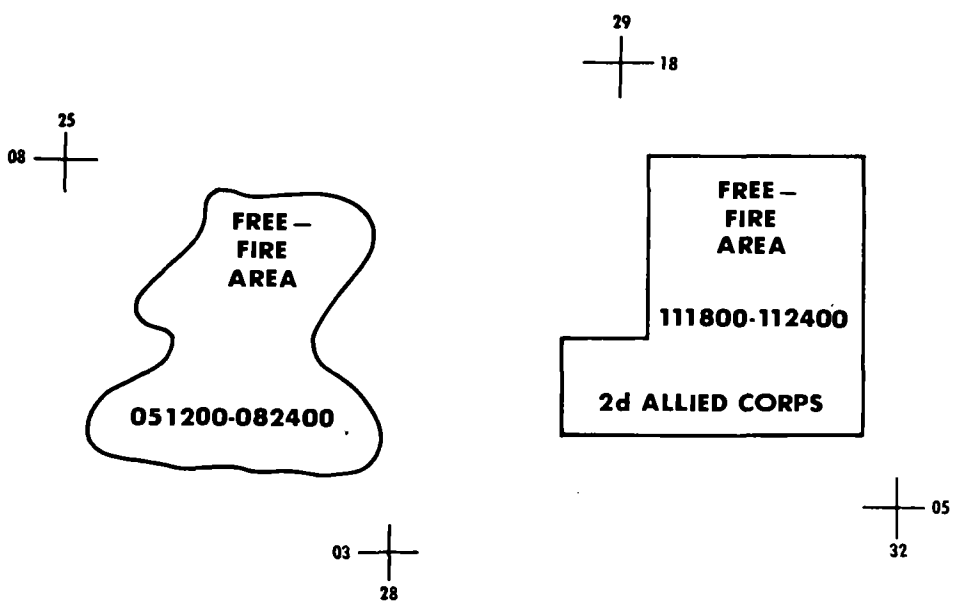


Figure 6–9. Graphical portrayal of free fire areas.

target within the no-fire area which is a major threat to US (Allied) forces *can and will* be engaged on order of the force commander.

6–20. Fire Coordination Area

a. A fire coordination area is an area in which specific restraints have been imposed and into which fires in excess of those restraints will not be delivered without approval of the establishing authority. A fire coordination area is established by the maneuver commander to control close defensive fires within an area in which his troops are located. The restrictions on firing into fire coordination areas may vary with locality and time. For example, a supported commander's restrictions may be:

(1) The target must be positively identified as hostile.

(2) The target (area) must be observed from the air and the ground, or both.

(3) If the criteria in (1) and (2) above have not been met, permission to fire must be obtained from the authority that established the area.

b. The fire coordination area is depicted on a fire support map or an overlay (figure 6–11) by outlining the area with a red line. The words "fire coordination area," the designation of the unit establishing the area, and the effective date-time group for commencement and termination are written inside the area. No fire delivery means may fire into this area without permission of the establishing authority unless it can meet the criteria in *a*(1) and (2) above. The area should be readily identifiable from the air, but the location can be given as a radius from a point. Preferably, identification of the area is disseminated to all levels in overlay form; however, it may be disseminated by radio or wire.

6–21. Nuclear and Chemical Safety Measures

Additional coordinating and limiting measures may be required for troop safety when nuclear and chemical weapons systems are used in support of ground operations. Safety measures should be related to well-defined terrain features when possible, based on a careful analysis of the effects of the weapons being used. The FSCOORD is the principal adviser to the commander on establishing safety measures. Typical safety measures are—

a. Use of lines of departure to coordinate exploitation of the effects of nuclear and chemical fires.

b. Use of phase lines or limits of advance or withdrawal to avoid unacceptable effects from nuclear and chemical fires.

c. Use of safety lines to indicate the limits to which special ammunition effects may be permitted to extend.

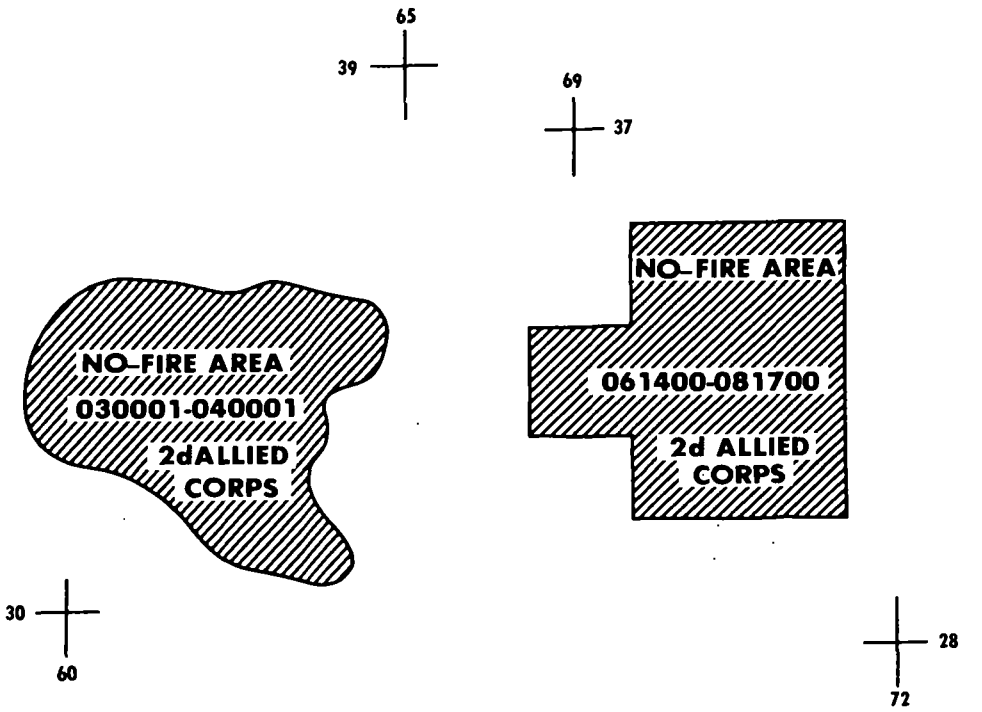


Figure 6–10. Graphical portrayal of no-fire areas.

Section VI. COORDINATION OF FIRE SUPPORT

6–22. General

a. The attack of targets is based on reports by forward observers and other agencies, the supported commander's guidance, the fire support available, or on request from higher headquarters or supported units of the force. More than one means of fire support may be used to attack a target.

b. In selecting the best means of fire support for a particular mission, the supported or force commander and the FSCOORD consider the—

(1) Type of support required.

(2) Allocation of fire support means.

(3) Characteristics of the target.

(4) Desired effect on the target, such as the effect obtained by neutralization, destruction, interdiction, or harassing fires.

(5) Characteristics, capabilities, and limitations of the available weapons, and their ammunition; e.g., accuracy, mobility, range, and yield.

(6) Most economical delivery means.

(7) Availability of the various types of fire support means and their ammunition supply, planning guidance, authority to expend, and established priorities.

(8) Relative difficulty of ammunition resupply.

(9) Speed of execution (response time).

(10) Problems of weather and terrain.

(11) Vulnerability of the means to be used.

(12) Effect of suppression of friendly fires, if required, during an airstrike.

(13) Communication facilities available.

(14) Safety of friendly troops.

(15) Predicted postattack condition of the target area.

(16) Tactical benefits to be gained.

c. During the planning phase, requests for allocation of fire support and requests for modification or change in allocation are forwarded through normal command channels.

6–23. Close Air Support

a. Close air support is the attack by air against hostile targets which are close to friendly forces and which require detailed integration of each air mission with the fire and movement of these forces.

b. Close air support is employed to neutralize or destroy enemy ground forces which present a direct threat to friendly ground forces. It is used against targets that are beyond the capability of organic fire support weapons, or when the added firepower of tactical fighter aircraft is necessary to achieve the desired results. Close air support is employed at the request of supported ground forces (FM 100–26).

c. Close air support includes those fires which

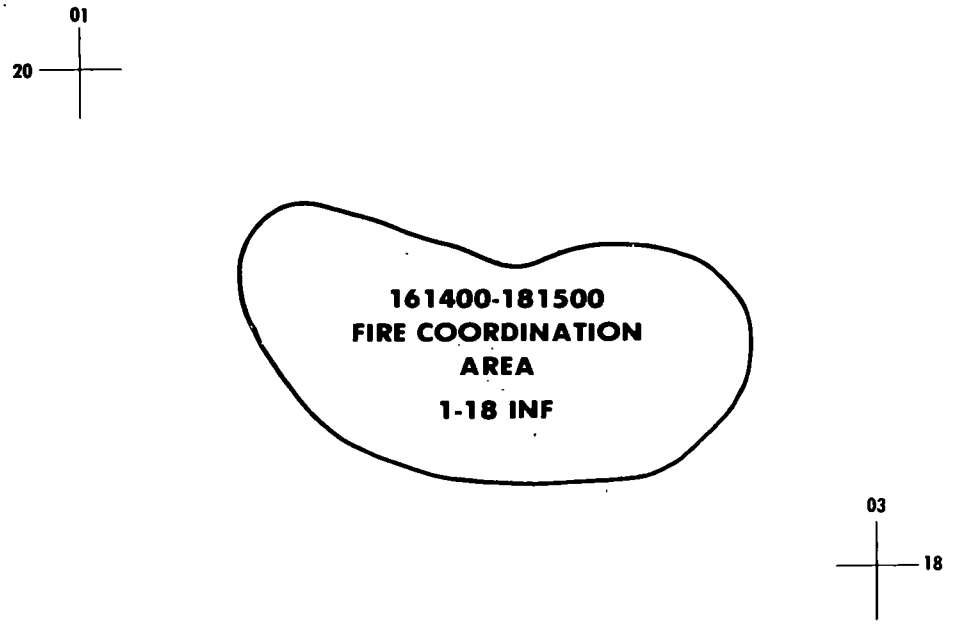


Figure 6–11. Graphical portrayal of fire coordination area.

are delivered in the proximity of friendly fires by attack helicopters, aerial field artillery, LOH's and door gunners on troop-carrying helicopters.

d. The Army air-ground system for originating and processing requests for tactical close air support is simple yet practical (fig 6–12).

e. The United States Armed Forces have ratified the details of agreement of STANAG 2134, Offensive Air Operations. When US Armed Forces operate as a part of a NATO force, the instructions given in STANAG 2134 will be followed. The FSCOORD should be familiar with the definitions, techniques, and procedures used when combat aircraft are engaged in close air support of ground forces and are directed by a forward air controller (FAC). Chapter 6 of STANAG 2134 deals with the instructions for the FAC and are referenced in appendix F of FM 6–140.

6–24. Types of Targets Suitable

Types of targets suitable for air attack include the following:

a. Mobile Targets. Aircraft which afford direct observation and high speed and which, unlike field artillery, have no requirement to adjust fire are well suited for the attack of mobile targets.

b. Targets Not Precisely Located. An armed aircraft which is a combination target acquisition system and weapon system is ideally suited to locating and destroying targets that are not precisely located and not directly observable from the ground.

c. Deep Targets. Often long-range aircraft are the only fire support means that can engage targets deep in the division and/or corps zone of influence or interest.

d. Hard Targets Inappropriate for Attack by Surface-to-Surface Fires. Aircraft rockets and air-to-surface missiles, with their high penetrating power, can satisfactorily engage hard targets when limited observation, excessive range, or adverse terrain preclude effective delivery of surface-to-surface fire. Hard targets may include, but are not limited to, bridges, tanks, and pillboxes and other concrete fortifications.

e. Unobservable Targets Requiring Confirmed Destruction. Field artillery often delivers fire (e.g., counterbattery fire) on targets that are not observable. The target may be within range of field artillery rocket or missile systems but may not meet the criteria for expenditure of rockets or missiles. Tactical air support may be used to conduct the mission; however, tactical damage assessment is a responsibility of the headquarters ordering the fires. When air support is used, tactical damage assessment must be conducted to determine if the attack was successful or if the target should be attacked again. To expedite operations, armed aircraft can attack the target and immediately report the results.

f. Other Targets. Tactical considerations often indicate that close air support is the best means of attacking a particular target, even though the target normally would be attacked by surface means. For example, aircraft that are on air alert and still have ordnance aboard at the time they are due off station can employ the ordnance on the target rather than jettison and waste it. As another example, aircraft can neutralize an enemy trench line (normally a good field artillery target) by mixing nonfiring passes with several firing runs. The TACP with the assaulting force can coordinate the runs, permitting the assaulting troops to continue to advance while the defender remains pinned down.

6–25. Categories of Close Air Support

a. Preplanned Missions. Preplanned missions (FM 100–26) are those missions requested sufficiently in advance of the time of execution to permit completion of detailed plans and briefing of pilots prior to takeoff. Normally, more effective coordination, more effective matching of ordnance to the target and more economical use of aircraft and missions are possible in preplanned missions than in immediate missions.

b. Immediate Missions. Immediate missions are executed in response to requests from supported ground commanders to fulfill urgent requirements that could not be foreseen. Details of the mission may be coordinated while aircraft are airborne. Aircraft allocated for immediate missions are maintained in either an air alert or strip alert status.

6–26. Preplanned Requests

a. Preplanned requests can be initiated by any Army echelon. Preplanned requests originating at the maneuver company level are forwarded to the battalion FSCC over the battalion command net or by any other means available. When a request is received at the FSCC, it is reviewed by the battalion S3/air, the FSCOORD, and the air liaison officer to determine suitability of the target for air attack and to consider potential airspace conflicts. If the target can be attacked by organic means, the request for air may be disapproved. If

the request is approved, the S3/air adds it to the file of preplanned requests, eliminates duplication, consolidates the remaining requests, and assigns them priority and precedence. He then forwards the consolidated requests to the S3/air at brigade over the division operations/intelligence net. The brigade S3/air processes company requests and forwards the consolidated requests to the G3/air at the division tactical air support element (TASE). At division, requests are processed in essentially the same manner as at brigade and battalion. Consolidated requests are forwarded to the G3/air at the corps TASE. The corps G3/air evaluates the division requests, assigns priorities to approved requests, and forwards them as Army requirements to the Army liaison element at the Air Force tactical air control center (TACC) (if corps is the highest Army headquarters). The TACC assigns sorties in accordance with priorities established by the Army, issues fragmentary orders, and notifies the direct air support center (DASC). The DASC advises the corps TASE of the mission. The corps TASE also receives air mission data from Army representatives in the TACC. All pertinent information is sent by the corps TASE to appropriate subordinate units and the TOC elements (e.g., ACE) concerned.

b. If a field Army headquarters and its associated tactical operations center (FATOC) have been established, the corps G3/air forwards the preplanned requests to the field Army G3/air, who will make the final consolidation and assign precedence and priority. The field army G3/air will send the consolidated list of army requirements to the Army liaison element at the TACC. From there, processing will proceed as described in paragraph *a* above.

6–27. Immediate Requests

Immediate requests can also be initiated from any army echelon. Below battalion level, they are sent to the battalion FSCC over the battalion command net or by any other means available. Each request is validated at the battalion level by the S3/air and fire support officer and is then passed to the battalion TACP. The TACP transmits the request directly to the DASC over the Air Force air request net. The TACP's at intermediate Army echelons monitor the transmission and acknowledge to the DASC that the request has been received. The DASC passes a copy of the request to the corps G3/air in the collocated TASE for army action and coordination. Meanwhile, the intermediate TACP's coordinate the request with the S3/air/G3/air and the FSCOORD at their echelons to determine if those levels approve or disapprove the request and to resolve any potential airspace conflicts. Coordination takes place at all echelons simultaneously. If any echelon above the initiating echelon disapproves the request for any reason, the TACP at that echelon notifies the DASC and the initiating TACP, giving the reason for the disapproval; and the request is cancelled. If the disapproval is made at corps level, the DASC notifies the originator, giving the reason for the disapproval. Normally, acknowledgment of requests by intermediate TACP's indicate approval by the associated Army echelon, unless within a specified time period, a disapproval is transmitted. Specified time periods for indicating disapproval should be established by SOP. In certain operational environments, it may be desirable that approval be indicated by specific transmission. When positive approval has been directed, intermediate TACP's transmit approval directly to the DASC. Meanwhile, the DASC accomplishes the planning and coordination required to satisfy the request, pending final approval of the corps G3/air and subordinate Army commands. If the request is approved, the DASC orders the mission flown, using the sorties allocated for this purpose. The DASC provides all pertinent air mission data to the TASE for its use and further dissemination in Army channels.

6–28. Disapproval of Air Requests

a. Both preplanned and immediate air requests can be disapproved for any valid reason at any Army echelon senior to the requesting echelon. For example, aircraft sorties may not be available because of higher priorities, or more likely, another fire support means, such as field artillery, is preferred because of its ready availability and comparative efficiency. Before action is taken to disapprove a request, consideration must be given to the fact that the requester has filed his request after a prudent target analysis. In the case of an immediate request, the initial target analysis has usually been made after direct target observation and the requester may well be awaiting his requested support under the most adverse conditions. The requester expects his air request to be approved or to have a substitute means of fire support provided. Any disapproval must be for valid reasons only, and the disapproving headquarters then incurs a responsibility to immediately notify the requester of the action taken and the alternate means of fire support to be provided,

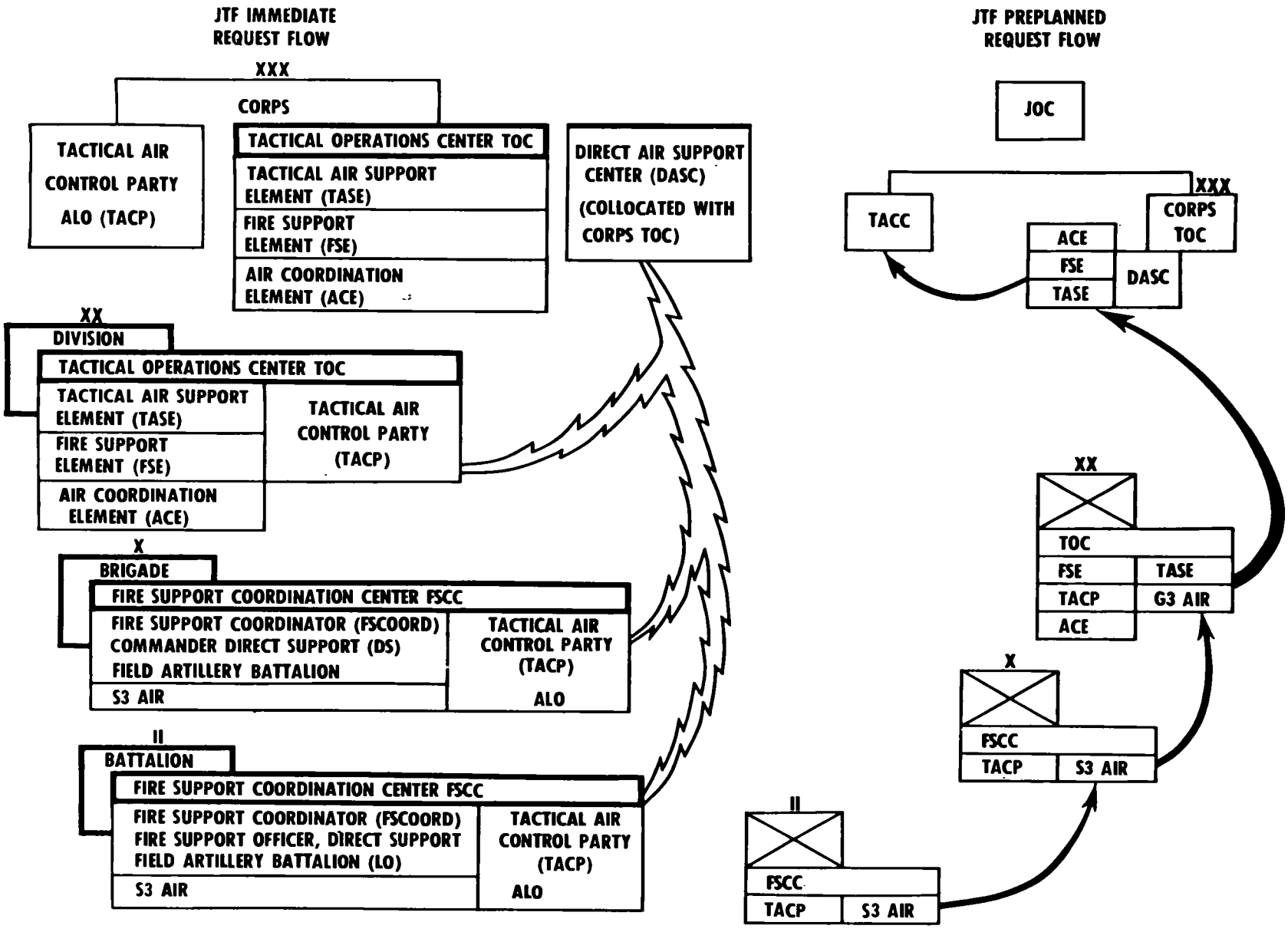


Figure 6–12. Tactical air support request channels for Air Force support.

if applicable. Time is of the essence in processing both preplanned and immediate air requests, because disapproval or modification of requested support may well alter the requester's plan of action.

b. The FSCOORD may exercise his responsibility to disapprove an air request for appropriate reasons. When a request is disapproved, the disapproving official has as much responsibility for insuring that another fire support means attacks the target as he does for invalidating an air request. The target is still a threat, and, in the case of an immediate request, valuable time has been lost in requesting air support and having it disapproved. With immediate requests, very little time is available to make these decisions, and speed is essential for a successful air ground system. With preplanned requests, more time is available for deliberate processing and resolution of questionable areas.

6–29. Basic Considerations in Processing Close Air Support Missions

Certain basic considerations must be weighed at each echelon before a decision is made to request or approve a close air support mission. A request for immediate close air support is normally initiated below maneuver battalion level. A request for preplanned close air support is normally initiated at maneuver battalion level. In either case, most of the coordination is effected by the maneuver battalion. However, because of safety considerations and his detailed knowledge of the tactical situation, the ground commander (or his representative) who is to receive the close air support should have control of that support. Considerations in processing close air support missions are discussed in paragraphs *a* through *d* below.

a. Maneuver Battalion. Targets encountered by a maneuver battalion normally are initially attacked by the means immediately available to the battalion, such as its organic weapons; the weapons of subordinate units or supporting field artillery; or naval gunfire. With this combat power available to the commander, it must be assumed that some special consideration would influence him to request close air support. The decision to request close air support is based on the relationship of the nature and threat of the target, to the nature of the available attack means, and of the effects of delivery of various types of ammunition in the proximity of the force to the scheme of maneuver. There is no standard pattern for considering these relationships, but the FSCOORD, G3 air/S3 air, and the CO must at least consider the major factors of time, target/weapon characteristics, observation, ammunition availability and resupply, terrain restrictions, and the airspace situation. These factors are discussed in (1) through (6) below.

(1) *Time.* The time factor is considered in three areas.

(*a*) *Response time.* The response time of close air support normally is longer than that of field artillery or naval gunfire, since it is tactically more economical to maintain aircraft on ground alert than on air alert. The flying time and the time to load special ordnance, if required, must be considered. Under certain conditions, high-performance aircraft and helicopters may be maintained on air alert, in which case close air support may be as responsive as ground delivery means.

(*b*) *Target stay time.* Except for fixed fortifications and defensive works, a target acquired by a maneuver battalion (e.g., an enemy infantry company, tank column) seldom remains concentrated for a significant period of time. The stay time of the target must be compared with the response times of the available attack means. If the stay time is too short for the target to be attacked with the most effective means, the most responsive means is used.

(*c*) *Maneuver time.* Maneuver time is that period during response time when the following should be taken into consideration: What is happening to the maneuver force, where will it be, and how long a wait can be afforded? Maneuver time must be coordinated with the S3.

(2) *Target/weapon characteristics.* In order to exploit the capabilities of each supporting arm and to avoid unnecessary duplication, the most effective means must be selected for attack of a target. Assuming favorable conditions for the employment of all supporting arms, a thorough knowledge of their lethality, and of the limitations of air, field artillery, and other available fire support means is essential in weapon selection. The attack system selected and its relation to the safety of the maneuver battalion is dictated by such considerations as the size and nature of the armament employed, closeness of the target to the friendly frontlines, accuracy of location of the target and frontlines, and adequacy of control.

(3) *Observation.* Target observation encompasses several aspects to include target location, observation and adjustment of fire on targets, surveillance of known target locations, and post-attack damage assessment. The inability of a ground observer to determine the precise location

of a critical target or to maintain observation of a moving target during adjustment indicates the desirability of employing close air support. Since the airborne FAC can employ direct observation of the target or target area, he can seek out and pursue the target, direct fire against it, and report the results of the attack. The capabilities and locations of the mortar forward observers (normally 12) organic to infantry-type battalions should not be overlooked. After coordination with the commander concerned, these forward observers can enter the FA fire direction net. Normally, there is one mortar forward observer with each rifle platoon leader and one with each rifle company commander. Employment of these FO's on a selected basis can increase the observed fire capabilities of the direct support field artillery (DSFA) battalion.

(4) *Ammunition availability and resupply.* There may be situations in which all other things are equal, but the available ammunition is waning, and resupply to the forward or most responsive/appropriate units is difficult or impossible. In such cases, elements other than the forward or most responsive/appropriate units should be tasked to fire the mission.

(5) *Terrain restrictions.* The terrain may dictate selection of the weapon. A hard target on a vertical face is ideal for attack by a gun, such as a 175-mm gun or a naval gun, but it is difficult for attack by mortars or light and medium howitzers. A hard target on a rear slope is difficult to attack by a gun because of the trajectory limitations, but is appropriate for attack by medium mortars or medium and heavy howitzers. In many cases, naval gunfire support ships can be maneuvered to reduce terrain restrictions. Aircraft are more effective because they can usually approach the target from the best direction. However, the best direction of approach for attack of the target may not be the best direction of approach as far as the safety of the aircraft is concerned. The battalion FSCOORD has specific responsibilities related to the welfare of the aircraft when close air support is selected as the most appropriate means of attack of a target. Restrictive fire plans, lifting/shifting of certain fires, and counterflak programs may be required, and the pilot must be warned of inherent dangers in the mission. Appropriate warning can be given by the FAC, FSCOORD, unit commander, or the ACE (at division level), or the warning may be provided in the initial request.

(6) *Airspace situation.* The airspace situation may favor use of field artillery over aircraft. Introduction of high performance aircraft into airspace already crowded by army aircraft and field artillery fires in support of local and adjacent operations may cause airspace coordination problems which could result in unnecessary delay of the other supporting operations.

b. Maneuver Brigade. At the brigade FSCC, the request by the maneuver battalion for close air support is monitored, and receipt of the transmission is acknowledged. The FSCOORD and the S3 air do not analyze the target according to the relationships considered by the requesting battalion. The FSCOORD and the S3/air base their recommendations to approve or disapprove the request on the brigade situation and any surrounding activities, which are generally unknown to the requester. The FSCOORD insures that the requester receives the fire support he requested, when possible, and that granting the request is in the best interest of the brigade. The air liaison officer (ALO) advises the FSCOORD on the safety of the aircraft in flying the mission. If the request is disapproved, the requesting battalion is notified and normally told why. A preplanned mission receives the same coordinating considerations as an immediate request and, where possible, is related to and combined with other requests. These considerations include—

(1) *Economy.* Each request is considered from the commonsense viewpoint. The brigade FSCOORD does not question the validity of the commander's *judgment and decision* in requesting air support. But, if there is a more economical means availab'e to satisfactorily attack the target in an acceptable time—a means now in the area or unknown to the requester at the time of the initial target analysis—it would be prudent to recommend substituting such means.

(2) *Safety.* Any danger to friendly troops or other supporting arms in flying a mission must be considered. The degree of danger acceptable without some restrictions on the other supporting arms and whether or not any additional warning should be given to the aircraft must be determined at this time. The FSCOORD must be constantly aware of the disposition of friendly troops and the tactical situation of the brigade; in addition, he must insure that airspace coordination has been accomplished with the S3/air (BACE, if formed).

(3) *Restrictions.* Any restrictions concerning engaging a target must be considered. Engage-

ment of a target may be restricted because of its proximity to a target necessary for further operations, or to a hospital or similar facility which must be protected for humanitarian reasons.

c. Division. The processing of a division mission is similar to the processing of a brigade mission; the same general considerations of economy, safety, and restrictions apply. The FSCOORD considers the request and any subsequent brigade transmissions concerning safety or restrictions. Approval or disapproval of the request will be in accordance with the advice and recommendations of the G3/air, the ALO, and the FSCOORD. The ability (or inability) of the ACE to provide an "airspace coordination clearance" at this time will also be considered. While the request is being coordinated at each intervening echelon, the G3/air and the ALO at the division TASE search for any hostile air defenses that may jeopardize the aircraft during the strike. Counterflak techniques are closely related to counterbattery fires and are often employed in support of close air support aircraft. Because of the detailed and close coordination required, counterflak fires are planned and coordinated by the FSCOORD in the FSE. The G3/air and the ALO play a very important part in planning these missions.

d. Corps. The DASC receives the immediate request at corps and processes the mission simultaneously with brigade and division. The same factors that are considered at division are considered at corps. At corps, for the first time, the target is matched with aircraft and ordnance. The DASC does not have the authority to fly the mission without the approval of the corps commander as requested by the G3/air and FSCOORD. One copy of the immediate request is passed to the G3/air and the TASE. The G3/air, being familiar with the situation, checks his maps for anticipated action in that area and consults the FSCOORD. The decision is then made to approve or disapprove the request. If the request is approved, it is presented to the DASC as an Army requirement. When a request is disapproved, the disapprover has the responsibility for insuring that another fire support means attacks the target. Requests for preplanned missions are transmitted to the G3/air rather than to the DASC.

6–30. Naval Gunfire Support

a. The landing force organization for control and employment of naval gunfire support includes special staff or liaison representatives, liaison teams, and shore fire control parties (SFCP) organic to the air naval gunfire liaison company (ANGLICO), Fleet Marine Force, are attached to divisions to provide the specialists and communications needed for the conduct of naval gunfire support. The naval gunfire liaison officer serves as a member of the supported units FSE/FSCC. Briefly, the landing force naval gunfire agencies are as described below:

(1) *Landing Force Naval Gunfire Section.* If established, the landing force naval gunfire section provides naval gunfire communications and facilities for landing force headquarters, performs naval gunfire special staff functions, and directs fires of assigned support ships. This section would be provided from assets made available to the joint amphibious task force commander. The ANGLICO does not have available assets to provide naval gunfire liaison personnel and communications above the division level.

(2) *Division Naval Gunfire Section.* The division naval gunfire section provides naval gunfire communications and facilities for division headquarters, performs naval gunfire special staff functions, and directs the employment of assigned support ships.

(3) *Regimental Naval Gunfire Liaison Team.* The regimental naval gunfire liaison team provides communications, liaison, and direction of naval gunfire in support of the maneuver brigade. In addition, the team directs the fire of assigned general support ships.

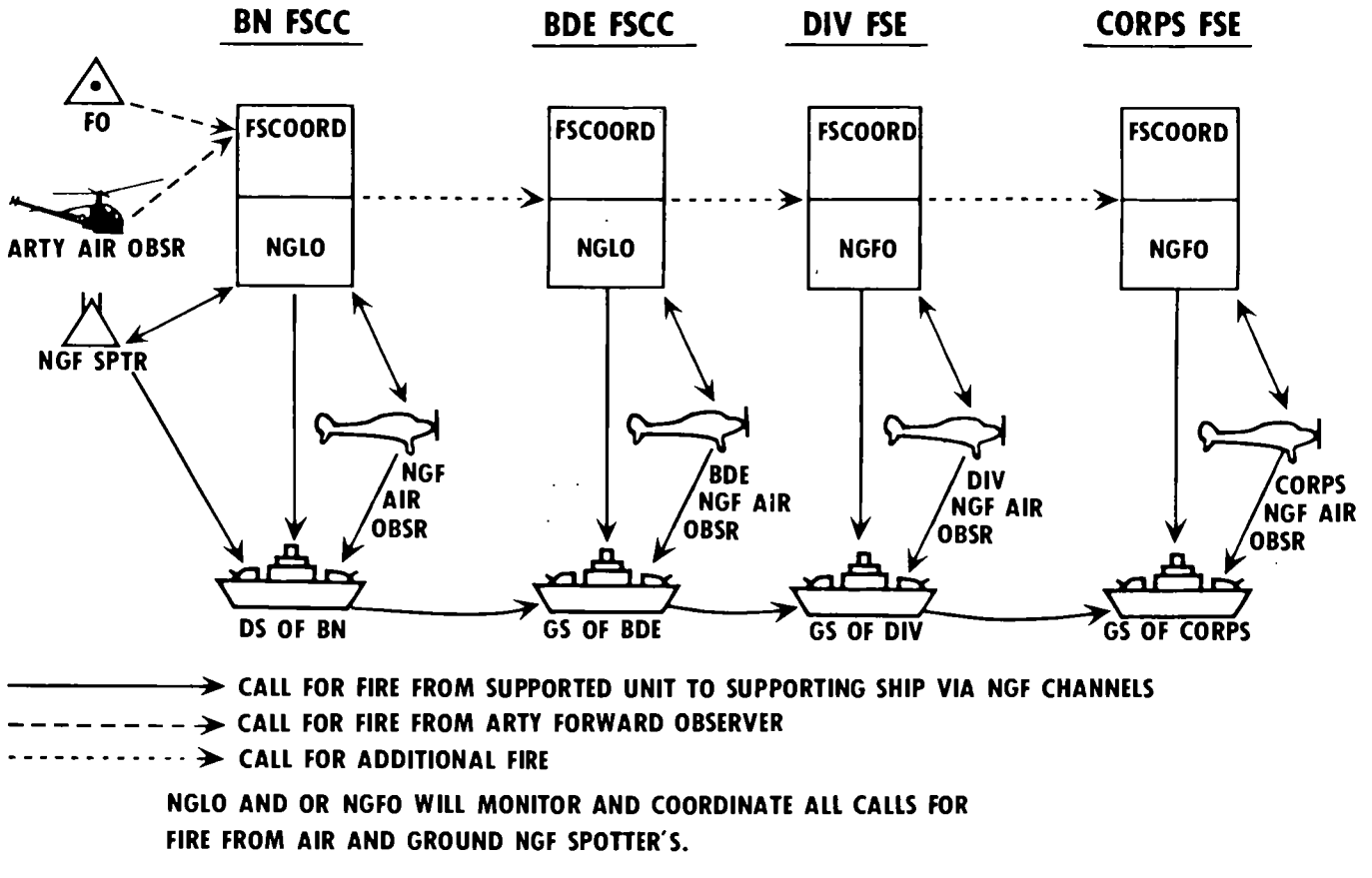
(4) *Battalion Shore Fire Control Party.* The battalion shore fire control party (SFCP) includes a naval gunfire liaison team and a naval gunfire spotting team. The naval gunfire liaison team is specifically organized to handle naval gunfire liaison matters for the supported command, while the spotting team is charged with requesting and adjusting fires of assigned direct support ships and general support ships (fig 6–13).

b. Missions normally assigned to fire support ships are as follows:

(1) *Destroyers.* Direct support of battalion-size units or general support of brigades or higher echelons.

(2) *Cruisers and rocket support ships.* General support of brigade or higher echelons.

c. Direct support naval gunfire can be provided as soon as communications are established between assigned direct support ships and shore fire control parties or other observers. A direct support ship delivers both prearranged fires and fires



Note: Observers (FO, AO and Mortar FO'S) may communicate directly with the DS ship when clearance has been granted by the FSCOORD.

Figure 6-13. Naval gunfire request channels (targets of opportunity).

on targets of opportunity. Calls for fire are initiated by the shore fire control party operating with the supported unit. Members of the shore fire control party are specially trained in the conduct of naval gunfire, but simplified procedures permit any supporting arms observer to adjust the fires of a ship. One spotting team is normally available to each committed maneuver battalion to call for and adjust naval gunfire. Requests for direct support fires originating within a maneuver battalion are transmitted directly to the assigned direct support ship. Calls for fire may be transmitted directly to the direct support ship by—

(1) The naval gunfire spotter.

(2) A naval gunfire air observer.

(3) The battalion naval gunfire liaison officer.

(4) The FA or mortar forward observer or an air observer if they have a radio which will net with a radio on the direct support ship.

(5) If the ship and the observers cannot net directly with each other, calls for fire may be passed from the forward observer or air observer to the direct support ship via the field artillery and naval gunfire liaison officers at the maneuver battalion FSCC. If the forward observer requires fire support in addition to that available from a direct support ship, a request must be submitted through command channels to the naval gunfire representative at the echelon at which a general support ship is available.

d. General support, as applicable to naval gunfire, refers to those fires delivered in support of the Army force as a whole or in support of an echelon thereof by ships not assigned to the direct support of any specific echelon of the Army force. Requests for general support are usually initiated by maneuver battalion or higher echelons of the Army force. They consist of requests for fire support beyond the capabilities of the ship assigned to direct support. Requests by subordinate Army force echelons for general support are made to each successively higher echelon for fulfillment of

the request at the level at which a general support ship is available.

6–31. Attack Helicopter Fire Support (Exclusive of Aerial Field Artillery)

a. When the tactical situation warrants, and the force commander deems it necessary, attack helicopters assigned to cavalry squadrons or attack helicopter battalions *may* be employed in a fire support role. Attack helicopters of aerial field artillery battalions, attack helicopter battalions, and air cavalry squadrons possess similar characteristics, and crew training for attack of surface targets is similar. However, because of the difference in roles and missions, attack helicopter units (i.e., attack helicopter battalions and air cavalry squadrons) may not be as thoroughly familiar with fire support operating conditions and procedures as are aerial field artillery units.

b. Coordination and integration of attack helicopters employed in the fire support role with other fire support means/agencies are accomplished by the FSCOORD of the supported unit. Fire requests channels for attack helicopters employed in the fire support role are the same as those shown in figure 6–5. The method of entrance of the attack helicopters into the fire support and airspace control channels is a matter of local SOP. Extracts of communication-electronics operating instructions should be exchanged between the field artillery units and attack helicopter and air cavalry units in order to provide a smooth transition for the attack helicopters into the fire support role. Informal liaison and frequent briefings among the units as to operating procedures will assist all concerned in the accomplishment of the mission. Adherence to normal aerial field artillery tactics and techniques by the attack helicopter units should be mandatory in order to preclude confusion during processing of requests and target engagement.

c. During the performance of the fire support role, the attack helicopters operate in the fire direction nets to provide immediate cross-coordination between all fire support means/agencies. In some cases it may be necessary to have the attack helicopters communicate with the ground force by radio on other than fire direction nets; extreme care should be exercised in such instances to avoid danger to the aircraft from other fire support agencies, and to preclude inadvertent attack of friendly units not identified by the aicraft.

d. For information and a complete discussion of the employment, command and control procedures, and authority for the employment of attack helicopters (to include aerial field artillery, when required) in the fire and maneuver role, see Section II, Chapter 6 of FM 100–26, "The Air-Ground Operations System."

e. For a complete discussion of Aerial Field Artillery fire support operations, see FM 6–102; and chapter 6, FM 100–26.

Section VII. COORDINATION OF SPECIAL AMMUNITION

6–32. General

Other firepower elements available to a commander which have a profound influence on operations are nuclear weapons—often referred to as special weapons—and chemical munitions, which require special handling and demand extraordinary control, security, and coordination.

6–33. Integration of Maneuver and Fires

Nuclear and chemical fires must be integrated with maneuver to achieve the desired result. The integration of maneuver and fires should be as detailed and specific as time and the situation permits. Effective integration occurs only when a concerted coordination effort is made by the G3(S3) and the FSCOORD during the conception and planning of an operation. To weld maneuver and fires into a single, cohesive entity requires that—

a. The commander's guidance be clear and explicit as to what each component of combat power is expected to accomplish.

b. Appropriate control means be established to provide weapons of appropriate effectiveness to the combat echelon able to control and employ them to the best advantage.

c. Provisions be made to reduce or minimize the risks and limitations to maneuver forces imposed by undesirable obstacles, induced contamination, inadvertent fallout, and chemical contamination. Coordinating and limiting measures should be established *before* the maneuver forces launch their exploitation.

6–34. Commander's Guidance for Employment of Nuclear Weapons

The commander's basic guidance for the employment of nuclear weapons should be included in the unit standing operating procedures. Additional guidance and modification to the basic guidance, as appropriate, should be announced by the commander at the time he announces his planning guidance. The commander's guidance for the employment of nuclear weapons should provide guidance on—

a. The type of targets to be attacked.

b. The purpose for which the nuclear weapons will be employed or the results the nuclear weapons are supposed to achieve in conjunction with the overall plan; e.g., nuclear fire superiority, initial rupture of the enemy defense to seal off a critical pass or defile, destruction of bridges, or neutralization of enemy reserves.

c. The assignment policy and desired nuclear reserve to be retained for attack of targets of opportunity.

d. The restrictions or restraints that may be imposed by the current tactical situation and/or higher headquarters.

e. Guidance on the integration of nuclear, chemical, and conventional fires.

6–35. Tactical Control of Special Ammunition

The tactical management of special ammunition is carried out through allocation and assignment of weapons and by prescribing special ammunition loads (SAL). It is a function of the FSCOORD to *recommend* the special ammunition allocations, assignment, and SAL's to the commander for those weapons under his control; therefore, it is essential that the FSCOORD thoroughly understand these terms.

a. Allocation. An allocation is the apportionment of specific numbers and types of complete special ammunition rounds to a commander for a stated time period as a planning factor for use in the development of war plans. An allocation permits the subordinate commander to develop plans based on the allocation of weapons, but it does not authorize the expenditure of any special ammunition. Additional authority is required for the actual dispersal of allocated weapons to locations desired by the commander in support of his war plans. The expenditure of these weapons is not authorized until released by proper authority. Before receipt of Presidential release, only allocations of special ammunition will be made. When Presidential approval is received, the allocating commander may grant authority to expend all or a portion of the allocation by assignment of weapons to subordinate commanders.

b. Assignment. An assignment is the authorization for a commander to expend a specific number of complete nuclear rounds. It may be made for a specified period of time, for a given phase of an operation, or for the accomplishment of a particular mission. It expires at the end of the period of time or on completion of the mission. Expenditure authority is given only to a *force* commander. They will not carry conditions, such as the requirement for obtaining approval from higher headquarters, before each round is fired. If this degree of control is required, an *allocation* should be made. When an allocation is changed to assignment, the number of weapons should be reduced only when absolutely necessary and notification of the reduction should be given as early as possible. Restrictions on the types of targets which may be attacked may be specified. These restrictions normally appear in the commander's guidance in the operation order or SOP. Any commander assigned weapons may further authorize expenditure by units under his control unless he is instructed otherwise. Although assignment of weapons is related to physical possession of special ammunition, a commander might receive this authority without having physical possession of the weapon. For example, he might receive authority to expend weapons which are to be delivered by aerial means and which are in the physical custody of the Tactical Air Force. When an adequate number of special ammunition rounds are available, they should, in accordance with Army doctrine, be released to those commanders that require them and can effectively employ them.

c. Special Ammunition Load. The special ammunition load is the specific quantity of special ammunition to be carried by a delivery unit.

(1) The distribution of special ammunition is controlled by prescribing the number of special ammunition rounds that will be carried by organic and attached delivery units retained under the commander's control. The commander may designate any special ammunition from his own authorization, or the authorization of a higher commander, that is to be carried in the SAL of a delivery unit that is under the control of a subordinate commander. Thus, a unit SAL may contain

special ammunition that supports the expenditure authority of the subordinate commander, as well as the rounds that support the authority to expend of higher echelons.

(2) For security purposes, the commander may position special ammunition so that a command may have more rounds in its delivery unit's SAL than it has the authority to expend. Conversely, the command may carry fewer rounds than it has the authority to expend.

(3) Special ammunition, availability permitting, is normally placed in all delivery units. This has two benefits—first, dispersal of special ammunition and, second, greater responsiveness after the decision to fire has been made.

(4) SAL's are replenished by directed individual issue.

6–36. Operational Considerations of Preinitiation, Induced Contamination, and Fallout

In considering the distribution of nuclear fires within the battle area, the commander and his staff are concerned with preinitiation, induced contamination, and fallout because of the influence these effects have on the scheme of maneuver.

a. Preinitiation. In order to achieve surprise, it may be desirable to fire many nuclear weapons at the same time or as close together as possible. However, the radiation from one round may cause another to be detonated prematurely. Therefore, possible preinitiation may influence the selection of weapons and may also require adjustment of the plan of maneuver. Procedures for minimizing the possibility of preinitiation through separation of nuclear bursts in time and space must be incorporated into the planning and scheduling of nuclear fires. These procedures are contained in FM 101–31–2 and FM 101–31–3.

b. Induced contamination. When a nuclear attack is planned, the nuclear weapons employment officer estimates the area of induced contamination and informs the commander and the staff of the hazard. Obviously, it is extremely hazardous for troops to enter and stay in an area of induced contamination. However, because of the great destruction near ground zero, where the induced contamination is found, there is seldom a requirement for troops to enter the area. Since this radiation decays rapidly, troops in tanks and armored personnel carriers may pass through ground zero at 30 minutes after a burst without undue risk. However, this is true only if the burst did not produce fallout. The dose rates will be extremely high around ground zero 30 minutes after a fallout-producing burst (FM 101–31–1). Induced contamination is relatively limited in area; therefore, minor adjustments in the scheme of maneuver can usually be made to avoid any serious effects. Courses of action that may be taken are discussed in FM 3–12.

c. Fallout. In comparison with induced contamination, the large area contaminated by fallout poses an operational problem of considerable importance. Although the height-of-burst calculations performed by the nuclear weapons employment officer are designed to provide 99 percent assurance of no *militarily* significant fallout, the possibility of obtaining an inadvertent surface or near-surface burst must always be kept in mind. The commander must weigh the demands of the tactical situation against the hazards caused by radiation. The data concerning militarily significant fallout are prepared by the chemical personnel of the TOC and presented to the commander as part of the FSCOORD's recommendation concerning attack of the target. The commander may elect to use *intentional* surface bursts when their employment would contribute more to the accomplishment of the mission than airburst effects. However, because of the large areas covered by fallout patterns, the deliberate use of surface bursts must be well coordinated and may be closely controlled by higher authority.

6–37. Basis of Employment

The employment of low and very low yield (10KT and below) nuclear weapons or chemical weapons that will produce negligible contamination is optimized when these weapons are given to the commander who normally requires them and can effectively employ them in accomplishing his mission. In judging the level at which these weapons should be employed, consider the following factors:

a. Target acquisition capability.

b. Type of target and threat.

c. Target/weapon compatibility.

d. Response time versus stay time.

e. Troop safety.

f. Weapon availability.

6–38. Evaluation of Factors at the Brigade Level

a. Target Acquisition Capability. Before fires can be planned, there must be suitable targets. Suitable targets will be presented in a given situation. An analysis of a typical target array of an aggressor motorized rifle division showed 80 percent of the targets presented were within the brigade area of influence and 20 percent were beyond the brigade area but within the division area of influence. Of these targets, 30 to 50 percent can normally be acquired in a 24-hour period.

b. Types of Targets and Threat. The types of targets suitable for nuclear attack at brigade level are those which present the most distinct threat to the brigade's mission. With the exception of nuclear delivery units, the brigade is primarily concerned with enemy formations no lower than two echelons; i.e., company-size units. Normally, only company-size units or larger would be capable of presenting or impairing the accomplishment of the brigade mission and would present a sufficient threat to the brigade to warrant the expenditure of a nuclear weapon. Chemical weapons may be effective against personnel protected from the blast and fragmentation effects of other types of weapons.

c. Target/Weapon Capability. The *radii of effects* of very low yield nuclear weapons or chemical weapons that will produce chemical contamination are such that these weapons are ideally suited to the type of enemy units capable of preventing or impairing the accomplishment of the brigade's mission; i.e., company and battalion-size units. Appropriate weapons are available at division field artillery.

d. Response Time Versus Stay Time. The stay time of enemy company- and battalion-size targets, including dismounted infantry, is short. The stay time of enemy mechanized and armor units is even shorter. Consequently, there is a need for quick target acquisition and target analysis. Because of the mobility and limited stay time of these brigade-type targets, rapid target analysis and quick response of weapon systems are imperative. These requirements can best be met through the assignment of appropriate tactical missions to delivery units and through the use of established fire request channels.

e. Troop Safety. The minimum safe distances (MSD) associated with low-yield nuclear weapons are such that, in most cases, the only friendly units that would be affected are the units under brigade control. Aircraft in the area would be affected; however, they can be warned through communications available to the brigade. When militarily significant chemical weapons effects are estimated to extend beyond the brigade's zone or sector, coordination with the adjacent commander is required.

f. Weapon Availability. The number and type of weapons available will determine the echelon to which these weapons are allocated or assigned.

6–39. Optimum Procedures

In any fluid operation, time is of the essence in the target acquisition-mission, processing-weapon delivery cycle. The nature of opposing targets and the range and speed of the acquisition and delivery means call for decentralized firing authority and streamlined processing procedures.

a. Assignment of Special Ammunition Loads. When there are indefinite numbers of very low yield nuclear weapons, they should be assigned to brigade level, at least to the brigade making the main effort in the attack or the brigade astride the most vulnerable area in the defense. At division level, except airborne and airmobile, the SAL of the brigade's direct support artillery battalion should contain at least the same number of 155mm weapons as are authorized for expenditure by the brigade in order to permit the direct support battalion to respond to brigade calls for fire. In the infantry division, the 155mm batteries of the general support cannon battalion should be positioned to reinforce the respective direct support battalions by responding to nuclear support calls for fire originating at the brigade and relayed through the direct support battalion FDC. Similar considerations apply to the division artillery 8-inch howitzer battery and the Honest John battalion.

b. Analysis, Processing, and Coordination Procedures. Because of time limitations and the absence of details on the composition and precise internal disposition of most targets, target analysis may be performed by the index method or by the visual method and a precut template. Proper attention must be given to troop safety, and a quick determination must be made of the side effects of induced contamination, tree blowdown, fallout (in the event of an inadvertent surface burst), or downwind chemical hazard which may affect maneuver. This analysis is performed in the

brigade FSCC by the FSCOORD, a trained target analyst. When the decision to fire has been made by the brigade commander, the mission is processed through field artillery fire control channels to the delivery unit capable of responding. The notification of intent to fire is transmitted to the DTOC over either operational (G3) or fire support coordination communication channels, and to adjacent brigades through lateral communication or by relay from the DTOC. Request channels are shown in figures 6–5, 8–2, and 8–3.

c. Warning Procedures. Warning messages must be transmitted to subordinate units. Air Force and Army aviation agencies must be warned so that all friendly aircraft can avoid the over-pressures and the risk of flash blindness (dazzle) resulting from the burst. These warnings can be transmitted directly from the brigade CP to the Air Force DASC (TAR net or TACP administrative nets), to the Army aviation flight coordination center (FCC) (through the aviation section), and to the fire support warning center (FSWC) for rebroadcast to airborne aircraft. The FSWC (or BACE if formed) can transmit this information to aircraft in the brigade area. Troop warning is accomplished through command channels. This procedure does not guarantee that every individual within sight of the burst will be notified: however, it does provide warning for those elements that would be directly affected, including aircraft in the area, in time for them to react.

d. Tactical Damage Assessment Requirements. Normally, an exploiting maneuver is essential to the employment of low and very low-yield nuclear or chemical weapons because they may not be, in themselves, decisive. Poststrike reconnaissance and damage assessment, *before the maneuver units are committed,* are essential to provide the commander with information that is vital to the operation. The brigade commander must know the actual ground zero, whether the enemy was located at the point of the detonation, the order of yield (normal or low-order burst), and whether obstacles were created. This information, which is obtainable by brigade or supporting observation and surveillance means, enables the commander to launch his exploitation as planned, or if needed, to modify his maneuver plans to accommodate the changed situation. The brigade FSCOORD is responsible for requesting and reporting the tactical damage assessment.

e. Summary of Optimum Procedures. The procedures for optimum employment of low-yield nuclear weapons rest on the following factors:

(1) Expenditure authority at brigade.

(2) Streamlined and rapid methods of analysis, procedures and warning.

(3) Effective integration of maneuver and fires.

Section VIII. FIRE SUPPORT DOCUMENTS

6–40. Fire Support Annex

The fire support annex is a supporting document of the force operations order. The fire support annex is prepared by the fire support element/fire support coordination center (FSE/FSCC), as directed by the supported commander, to insure complete coordination of the scheme of maneuver with the plan of fire support. It is based on the fire support portion of the commander's concept of operation and provides specific information and instructions for fire support agencies. The fire support annex serves as the basis for preparing the individual fire support appendixes of the mortar, air, field artillery, air defense artillery (fire support role), and naval gunfire agencies and the fire support appendixes for chemical and nuclear weapons when they are required. Examples of fire support annexes are shown in appendixes D, E, and P.

6–41. Fire Support Appendixes

Fire support appendixes are prepared as follows:

a. Mortar Fire Support Appendix. The mortar fire support appendix is prepared by the company mortar platoon leader. It is normally in the form of a target list. Once approved by the commander, it becomes a portion of the fire support annex. See FM 7–10 and FM 23–91 for detailed discussions of the mortar fire support appendix.

b. Air Fire Support Appendix.

(1) The air fire support appendix is integrated with other fire support appendixes to implement the force fire support annex. When published, the planning data for air fire support becomes an appendix to the fire support annex.

(2) The air fire support appendix is prepared by the G3(S3) air. This document includes all fire support to be delivered by tactical air forces.

(3) The air fire support appendix may consist of a list of preplanned air requests supported by mutually understood SOP's, messages, and written or verbal agreements between Army and tactical Air Force commanders. On the other hand, it may be a formal plan complete with overlays, tabs, and inclosures. There is no rule as to how much of the air fire support appendix will be detailed in formal style. Such factors as the extent and complexity of the operation, the size of the forces involved, the friendly and enemy air situation, and the degree of command and staff liaison will influence its makeup.

(4) Targets appearing in the air fire support appendix are numbered in accordance with the target numbering system in appendix C.

(5) An example of an air fire support appendix is shown in appendix F.

c. Field Artillery Fire Support Appendix. The field artillery fire support appendixes are prepared at the field artillery fire direction centers of the direct support battalions, the division artilleries, and corps artillery. The appendixes may include chemical and nuclear fire planning data as to the time and method of attack by appropriate firing units. When published, the planning data for field artillery fire support becomes an appendix to the fire support annex. An example of a field artillery fire support appendix is shown in appendix G. The field artillery fire support appendix is discussed in greater detail in chapter 10.

d. Chemical Fire Support Appendix.

(1) Chemical ammunition, like nuclear weapons, requires an allocation and authorization to expend and an announcement of the ammunition load for a specific operation.

(2) Some operations may require the development of a separate chemical fire support appendix. Under other circumstances, targets for attack by chemical weapons may be integrated in the appendixes of appropriate delivery agencies (e.g., field artillery, mortar, air).

(3) The chemical fire support appendix for division or corps operations is prepared by the chemical representative in the FSE of the TOC. The actual scheduling of the various fire support delivery systems must be coordinated with the air, field artillery, and naval representatives at the TOC.

(4) When published separately, the planning data for chemical fire support becomes an appendix to the fire support annex. An example of a chemical fire support appendix is shown in appendix H.

e. Naval Gunfire Support Appendix. The naval gunfire support appendix is prepared by the senior naval gunfire representative in the FSE of the TOC or in the FSCC as appropriate. It is integrated with other fire support appendixes by the FSCOORD. When published, the planning data for naval gunfire support becomes an appendix to the fire support annex. A naval gunfire support appendix is shown in appendix I.

f. Nuclear Fire Support Appendix. The planning data for nuclear fire support may be published as a separate appendix to the fire support annex or may be included in the air fire support appendix, the field artillery fire support appendix, and/or the naval gunfire support appendix. If it is published as a separate appendix, planning data is given to the appropriate agency for inclusion in its planning for fire support. An example of a nuclear fire support appendix is shown in appendix J.

g. Illumination Support Appendix.

(1) If the situation warrants the publication of a separate illumination document, it becomes an appendix to the fire support annex. The illumination support appendix consists of a written portion, a target list, a target overlay, and an illumination support table. The illumination support appendix differs from the field artillery fire support appendix (para 10–12 through 10–17) in the following respects:

(*a*) Since the amount of illuminants used in an illumination mission largely depends on atmospheric conditions, the duration in minutes of illumination on each target, rather than the amount of illuminants to be used on each target, is given in the illumination support table.

(*b*) The size of each target to be illuminated is expressed as the diameter of a circle in the size column of the target list.

(*c*) When an illumination mission is to be fired by an indirect fire weapon system using illuminating projectiles, the technique of illumination (i.e., one weapon, two weapon, two weapon deflection spread, etc.) is given in the remarks column of the target list.

(2) Illumination target numbers are assigned by the FSE/FSCC. A block of numbers may be reserved for illumination targets.

(3) There is no prescribed format for the written portion of the appendix. It should contain available information concerning the use of illumination in support of the operation.

(4) Coordination is accomplished at all eche-

lons to insure integration of battlefield illumination with fire support means.

(5) For an example of an illumination support appendix, see appendix K. For request channels, see figures 6–14, 6–15, 6–16.

6–42. Charts and Records

Examples of fire support coordination charts and records for conventional and special ammunition are shown in appendix N.

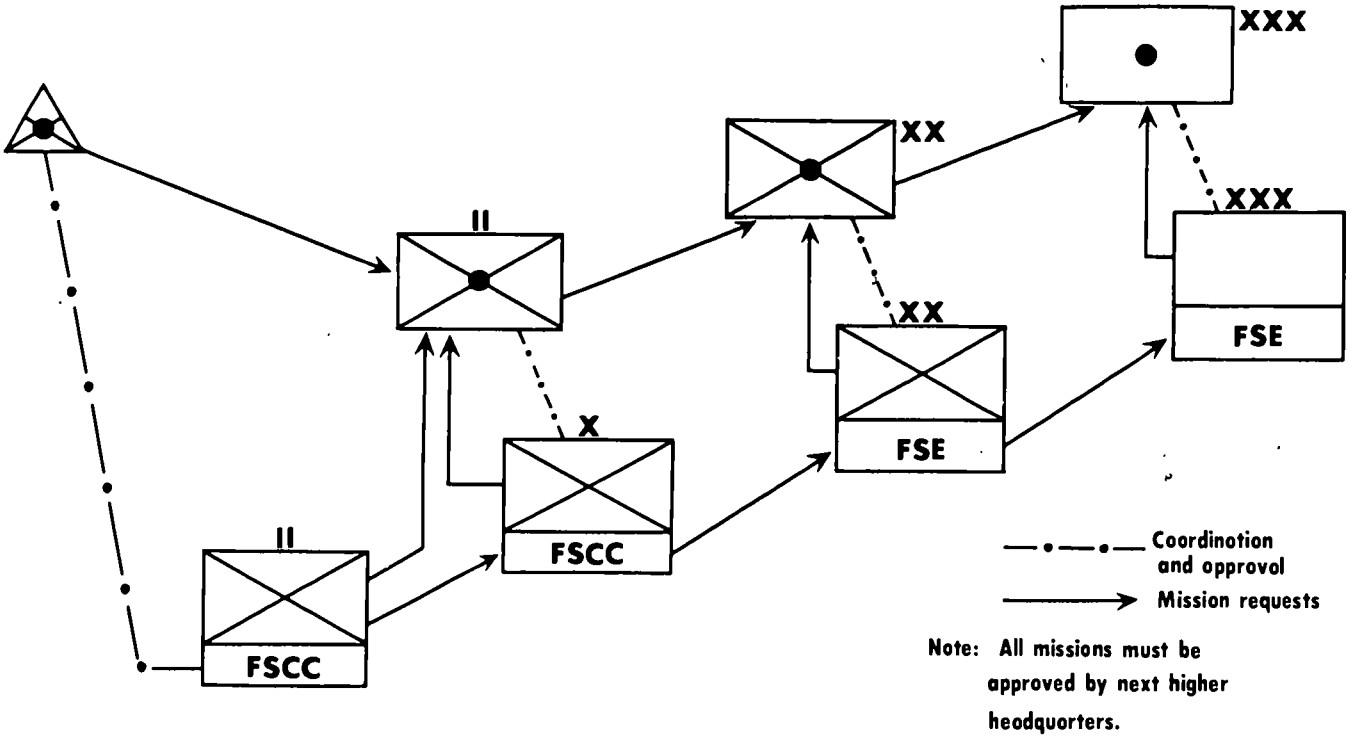


Figure 6–14. Field artillery searchlight illumination request channels.

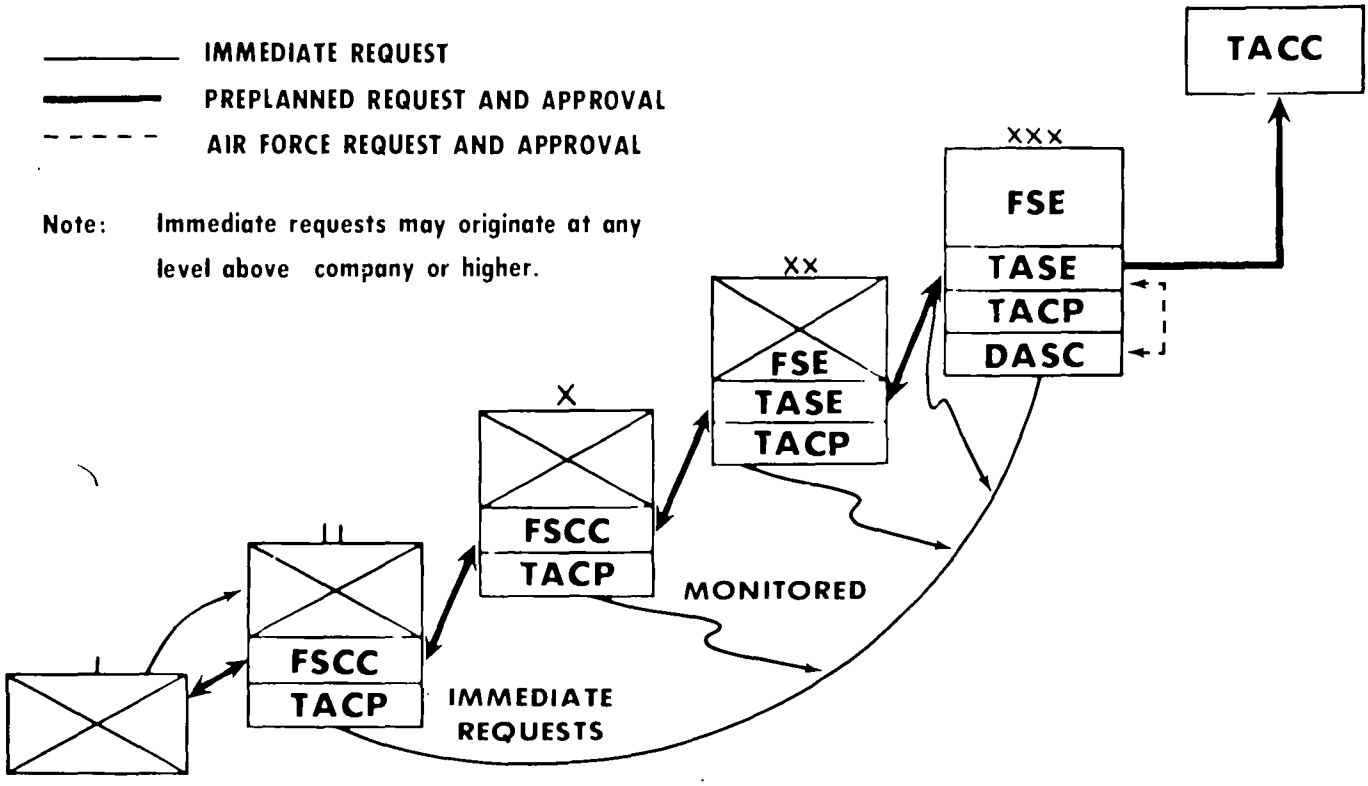


Figure 6–15. Tactical air illumination request channels.

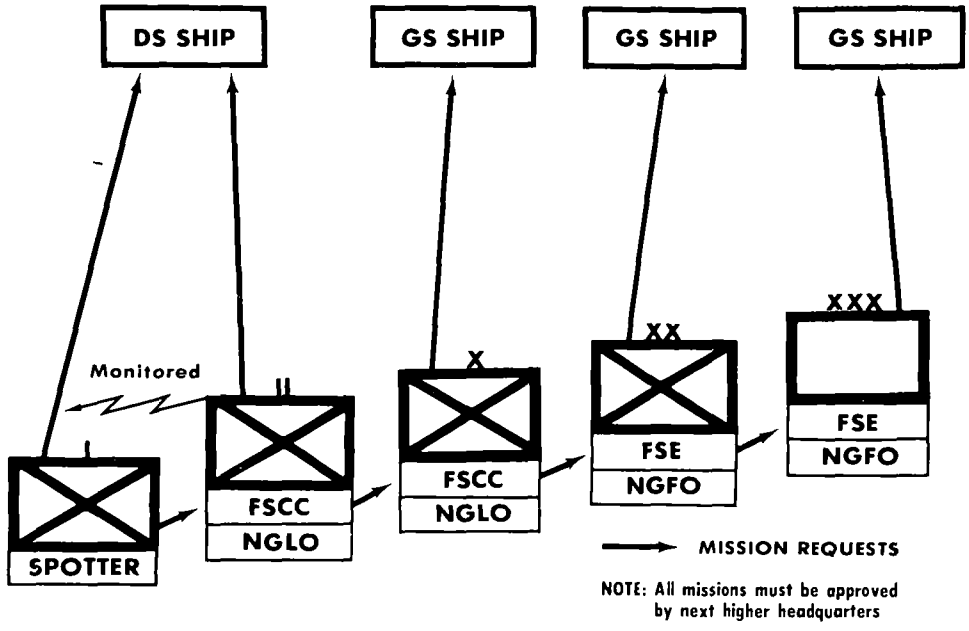


Figure 6–16. Naval gunfire illumination request channels.

CHAPTER 7

SPECIAL OPERATIONS

Section I. GENERAL

7–1. Definition

Special operations are those operations in which terrain, weather, the nature of the operations, or a combination of these factors creates the need for special techniques, tactics, training, or equipment.

7–2. General

Special operations include amphibious, night, mountain, jungle, and desert operations, combat in built-up areas; river crossings; and stability, airmobile, airborne, cold weather, and riverine operations. Special field artillery tactics and techniques to be considered in the conduct of these operations are discussed in this chapter.

7–3. Special Considerations

Employment of field artillery in support of special operations requires particular emphasis on estimates, plans, and training. For example:

a. Information and intelligence on which estimates are based often come from other than US agencies. In some operations, it is impossible to verify the information because of the distance to or the inaccessibility of the area of operations.

b. Plans developed from estimates based on information discussed in *a* above must be extremely flexible in order that they may be adjusted to unforeseen situations in the combat area.

c. Plans for employment of field artillery in special operations include—

(1) Liaison and coordination with appropriate arms and services of the forces (host country) concerned.

(2) Acquisition and analysis of targets.

(3) Coordination of fire support.

(4) Amounts and types of field artillery and ammunition required during various stages of the operation.

(5) Organization for combat.

(6) Details of employment of field artillery units to include movement into selected position areas, registration, field artillery fire support appendixes, and survey.

(7) Special equipment and procedures required.

d. Training for special operations includes training in—

(1) The use of special equipment.

(2) The operation, care, and maintenance of equipment under unusual terrain and weather conditions.

(3) Special techniques required to apply basic combat doctrine.

(4) Language, government, topography, and customs of the area of employment.

Section II. AMPHIBIOUS OPERATIONS

7–4. General

Most of the standard tactics and planning techniques for the employment of field artillery in normal combat operations are applicable to the employment of field artillery in amphibious operations. Differences that exist apply primarily to the planning, movement, and assault phases of the operation. Some of the standard tactics and techniques must be slightly modified, and other tactics and techniques peculiar to the employment of field artillery in amphibious operations have been adopted. This section emphasizes the tactics, techniques, and considerations applicable to planning, rehearsal, movement, and landing operations and to subsequent operations ashore. The same tactics, techniques, and considerations, with minor differences, are also applicable to the employment of field artillery in amphibious raids, demonstrations, and withdrawals.

7-5. Initial Field Artillery Planning

The procedures for planning the employment of field artillery to support amphibious operations are similar to those for planning normal tactical operations. However, planning for an amphibious operation is characterized by particularly detailed staff work.

a. Initiation of Field Artillery Planning. Upon receipt of initial planning guidance from the landing force commander, field artillery units at all echelons establish the necessary liaison to facilitate planning. Command and staff liaison is established with appropriate naval and landing force commands. The objective is to provide the best possible field artillery organization and delivery means to support the operations envisioned by the commander's concept. Planning is coordinated at every level and is accomplished in sufficient detail to allow subordinate field artillery echelons to conduct concurrent planning. When planning discloses the need for special training, the landing force field artillery officer includes such requirements in his training directives.

b. Field Artillery Planning Tasks. Early in the planning phase, the landing force field artillery officer prepares an estimate to determine the capability of the field artillery to support each of the proposed courses of action. Concurrently, the field artillery officer evaluates overall field artillery requirements for the operation. After the landing force commander has announced his decision and concept of operations, the field artillery officer prepares a final estimate of artillery requirements. The estimate becomes the basis for all subsequent field artillery planning. After the scheme of maneuver and the plan of supporting fires are determined, the landing force field artillery officer prepares the plan for the employment of field artillery; the plan, when approved, becomes the field artillery fire support appendix to the fire support annex to the landing force operation order. Subordinate commanders and their staffs concurrently develop estimates and subsequent plans, which are based on their own units' capabilities and requirements.

7-6. Estimate of Supportability

The estimate of supportability prepared by the landing force field artillery officer (para 7-5*b*) is part of the framework for the landing force commander's estimate and decision. The estimate analyzes the comparative capabilities of the field artillery to support each contemplated course of action.

a. Influencing Factors. In preparing the estimate, the landing force field artillery officer lists all information and necessary assumptions that pertain to field artillery. He determines the advantages and disadvantages of each course of action by considering the following factors:

(1) Landing force mission.
(2) Enemy situation.
(3) Required field artillery support.
(4) Hydrography.
(5) Topography.
(6) Weather.
(7) Observation requirements.
(8) Communication requirements.
(9) Use of special weapons.

b. Preparation. Written estimates of supportability are prepared at the field artillery command echelons and at echelons for separate operations or when requested by the supported unit commander. The field artillery viewpoint is reflected in the analysis and comparison of courses of action and in the conclusions made by the field artillery officer in the estimate. The body of the estimate contains five paragraphs.

(1) *Paragraph 1, mission.* Paragraph 1 states the impact of the mission on the field artillery, and contains previous decisions pertinent to the field artillery.

(2) *Paragraph 2, situation and considerations.* Paragraph 2 contains four subparagraphs as follows:

(*a*) Characteristics of the area of operations.

(*b*) Discussion of enemy capabilities.

(*c*) Discussion of friendly forces available and friendly courses of action.

(*d*) Assumptions pertinent from a field artillery viewpoint.

(3) *Paragraph 3, Field Artillery Analysis.* Paragraph 3 contains a discussion, from the field artillery viewpoint, of friendly courses of action. The discussion in paragraph 3 concerns the factors affecting the employment of field artillery with the landing force.

(4) *Paragraph 4, Evaluation.* Paragraph 4 states the advantages and disadvantages in the employment of field artillery to support each course of action.

(5) *Paragraph 5, Conclusions.* Paragraph 5 includes the following:

(*a*) A statement as to which course of action under consideration can best be supported from a field artillery point of view.

(*b*) A statement of the disadvantages which render the other courses of action less desirable. These courses of action are normally listed in order of decreasing degree of supportability.

(*c*) A statement of significant problems to be solved and limitations to be taken into account.

(*d*) A statement of measures required to solve the problems involved.

7–7. Estimate of Field Artillery Requirements

An estimate of field artillery requirements is normally made by the landing force field artillery officer after the landing force commander has announced his decision. The purpose of this estimate is to insure that adequate field artillery support is provided for the operation.

a. Determination of Requirements. The estimate establishes the—

(1) Amount of field artillery required by type and caliber.

(2) Amount of ammunition and fuzes required by type.

(3) Number of landing craft, amphibious vehicles, and amphibious ships required, by type.

(4) Amount of special equipment required by type.

b. Influencing Factors. When preparing the estimate of field artillery requirements, the landing force field artillery officer makes an analysis of each of the factors listed below in terms of the requirements listed in *a* above.

(1) Mission of the landing force.

(2) Scheme of maneuver.

(3) Enemy situation.

(4) Characteristics of the area of operations.

(5) Estimate of the duration of the operation.

(6) Employment of auxiliary weapons as field artillery.

(7) Employment of other fire support means.

(8) Employment of nuclear and chemical weapons.

c. Preparation. Written estimates of field artillery requirements are prepared in a form similar to that of the estimate of supportability.

(1) *Paragraph 1, mission of the landing force.*

(2) *Paragraph 2, scheme of maneuver.* The scheme of maneuver of each supported unit must be studied to determine what field artillery is needed for adequate support. If the landings are to be made over widely separated beaches or landing zones, field artillery requirements may increase, particularly in the long-range types of cannons.

(3) *Paragraph 3, enemy situation.* The enemy situation must be considered with respect to the following:

(*a*) *Nonfield artillery forces.* Enemy forces other than field artillery are considered in respect to the number and type of units. Their disposition, armament, mobility, amount and type of equipment, and combat efficiency must be analyzed.

(*b*) *Field artillery.* The amount, type, caliber, and range capability of enemy field artillery will influence the requirements for weapons, ammunition, and special equipment.

(4) *Paragraph 4, characteristics of the area of operations.* The following must be considered:

(*a*) Hydrography.

(*b*) Topography.

(*c*) Weather.

(5) *Paragraph 5, estimated duration of the operation.* The estimated duration of the operation will influence the amount of ammunition required.

(6) *Paragraph 6, employment of auxiliary weapons.* The number and type of other weapons available and their capability for employment in the field artillery role will influence the amount of field artillery required. However, caution must be exercised in reducing field artillery strength, since auxiliary weapons have primary missions of their own.

(7) *Paragraph 7, other fire support means.* Other fire support means considered for employment are—

(*a*) *Naval gunfire support.* The amount and type of naval gunfire support available and the duration of its availability will influence the amount of field artillery required, particularly the heavy calibers.

(*b*) *Close air support.* The amount and type of close air support available must be considered in determining overall field artillery requirements.

(8) *Paragraph 8, employment of nuclear and chemical weapons.* The availability of nuclear and chemical weapons and their potential employment will influence all requirements. The degree to which they influence the requirements will depend on the commander's concept of operations.

(9) *Paragraph 9, conclusions.*

7-8. Planning for Field Artillery Employment

During the planning phase, the field artillery commander and his staff carefully analyze the area of operations, the situation, the logistic support available, and the concept of operations in developing staff estimates for the landing force commander. Special emphasis must be given to certain considerations peculiar to the employment of field artillery in amphibious operations. These considerations include—

a. Aggressiveness. The field artillery must be employed boldly in an amphibious assault as a requisite to early support of the landing force. Measures normally considered essential to security in land warfare are often sacrificed in the amphibious operation. The necessity for early entry into combat to provide the required fire support will often place the field artillery adjacent to other units in crowded and compact position areas. The absence of defilade and of protective positions cannot be allowed to delay the entry of field artillery into combat. Nevertheless, units should not be landed or committed to action in areas subjected to intense small-arms fire. Field expedients based on experience may have to serve as substitutes for normal means of accomplishing tasks. Maximum use of aerial field artillery units should be considered. Forward observers must be capable of calling for and adjusting naval gunfire until the field artillery has landed and, if necessary, at other times. The talents of naval gunfire personnel are exploited in planning, coordinating, and adjusting field artillery fires when naval gunfire support ships are beyond range or are no longer available. Various means (helicopters, landing craft, LVTP's, causeways, etc.) are used for landing and displacement, particularly in providing fire support from off shore islands and promontories or in unusual situations created by the characteristics of the area.

b. Concept of Fire Support. In stating his concept of operations, the landing force commander states his requirements for fire support. A concept of fire support is generally evolved from the field artillery estimate of supportability and other staff estimates provided by air and naval gunfire agencies. It is a statement of the broad outline of the commander's intent regarding the provision of supporting fire support for subsequent operations.

c. Concept of Logistic Support. The concept of logistic support for field artillery must complement the concept of fire support in order to provide for the most effective employment of field artillery. The concept of logistic support is based on the capability of the service support agencies of the landing force, as well as on the concept of operations. Consideration must be given to ammunition, maintenance, replacement, and resupply problems envisioned during the amphibious operation. The logistic capability of the field artillery organization must be exploited to overcome any problems that arise prior to the landing and installation of logistic agencies of the landing force.

d. Organization for Combat. The fundamentals of organization for combat for an amphibious operation do not vary significantly from those applicable to organization for combat in land warfare; however, the separation of tactical units that often characterizes modern amphibious operations will sometimes require the attachment of direct support field artillery units or certain of their elements to battalion landing teams and brigade landing teams. When the landing force is comprised of a single division or a smaller unit, all field artillery assigned to the landing force should normally be attached to the senior field artillery headquarters with the force. When the landing force controls more than a single ground tactical element, a separate landing force field artillery headquarters is generally established.

e. Organization for Embarkation. The organization for embarkation must facilitate the concepts of operations, fire support, and logistics to the extent that entry into combat, effective fire support, and sustained operations can be accomplished (para 7-12).

f. Type of Control. The organization for combat should permit the maximum practical degree of centralized control consistent with the commander's concept. The attachment of units and elements to assault maneuver battalion landing teams and brigade landing teams requires that flexibility of control be exercised over the subordinate artillery units. Field artillery commanders should not hesitate to decentralize control when it will accelerate entry into action or permit more effective employment or when decentralized control is necessitated by the situation. Reestablishment of centralized control at the earliest possible time at the highest field artillery level is desirable.

g. Fire Support Coordination. Coordination of supporting arms is particularly difficult during the initial assault until the landing area has been sufficiently expanded to allow sufficient area for maneuvering the fire support means. Therefore,

the coordination of fire support must be given special attention during the planning phase. Due to the density of units, extra care is warranted to preclude violation of control measures such as boundaries, fire support coordination lines, no fire lines, and phase lines.

h. Communications-Electronics. Comprehensive communications-electronics plans are issued by the battalion and by higher field artillery units to insure effective communication during the critical period of the assault and subsequent operations ashore.

7–9. Formulation of the Field Artillery Fire Support Appendix

The appendix for field artillery fire support is developed after the landing force commander has reached his decision and announced his order, or has provided the necessary guidance for the field artillery planning to continue. The field artillery fire support appendix is based on the landing force commander's concept of operations, the final allocation of field artillery units, and the tactical principles of field artillery employment.

a. Development of the Appendix. All of the factors discussed in paragraphs 7–7*b* and 7–8 are reevaluated with respect to field artillery units allocated to the landing force. Field artillery requirements must also be evaluated in light of the following factors, which influence the capability of field artillery to provide adequate fire support:

(1) *Organization for combat.* When combat elements land on widely dispersed beaches, it may be necessary to attach field artillery to the assault units. Those field artillery units not attached may be given missions of general support, general support-reinforcing, or reinforcing.

(2) *Organization for embarkation.* Field artillery with a direct support mission should embark with the supported unit. Other field artillery should be organized for embarkation in accordance with the assigned tactical mission. The availability of shipping, air transport, and helicopter lift may preclude embarkation with the supported unit and must be considered in developing the organization for embarkation.

(3) *Zones of fire.* The principles for establishing zones of fire in land operations are applicable to amphibious operations.

(4) *Position areas.* The force field artillery commander must coordinate the assignment of position areas for the field artillery units with the force.

(5) *Target information and survey control.* Field artillery intelligence agencies must exploit every available source to locate targets and to determine the amount of survey control existing on or near the beachhead.

(6) *Communications.* The control and coordination of field artillery units of the landing force during the ship-to-shore movement make it imperative that simple, reliable, and flexible communications be available. Communication is required between the force field artillery commander, all subordinate field artillery elements, and the logistic elements, whether afloat or ashore.

(7) *Logistics.* The field artillery commander at each echelon should have a sound logistic plan. Of particular importance is a detailed ammunition plan to provide for the rapid unloading and delivery of ammunition to firing positions ashore.

(8) *Time of landing.* The time of landing depends on such factors as the need for field artillery ashore, available position areas, conditions of beach entrances and exits, and the ability of the shore party to effect the landings. For these reasons, direct support field artillery is normally landed in "on-call" waves.

(9) *Reconnaissance.* Continuous reconnaissance is made of the objective area, utilizing every means available. An air or seaborne reconnaissance should be made of the beach area and immediate terrain inland to select the best landing beaches, position areas, routes, and observation facilities.

(10) *Observation.* The degree to which observation can be provided will be influenced by the terrain of the beachhead, the number of observers available, and, in some cases, the number of aircraft available.

(11) *Counterbattery responsibilities.* Counterbattery responsibilities will normally be included in the estimate of the situation by the landing force commander.

b. Preparation of the Appendix. The plan for field artillery fire support of the landing force or principal subordinate elements thereof (division or corps field artillery) is published as an appendix to the fire support annex. This appendix contains the necessary information and instructions pertaining to the employment of field artillery. In an amphibious operation, the field artillery fire support appendix is always complete and is written in detail; however, references may be made to other annexes/appendixes for certain aspects of field artillery employment to avoid unnecessary repetition. Detailed instructions concerning gunnery are normally contained in the unit SOP. Spe-

cific details concerning the operation and instructions that vary from the SOP are included in the appendix.

c. Applicability. The field artillery fire support appendix is applicable to all field artillery under the control of the landing force. Missions are usually assigned only to those field artillery units retained under direct control of the field artillery headquarters of the command issuing the order. Nevertheless, specific instructions may be included for field artillery units attached to subordinate elements to insure continuity and overall effectiveness of field artillery support. For example, the field artillery fire support appendix to the fire support annex to the division operation order may prescribe that a direct support battalion attached to a brigade landing team be prepared to deliver counterbattery fires on order of the division artillery commander.

d. Tabs and Inclosures. Information that is too voluminous to include in the body of the field artillery fire support appendix may be included in tabs and inclosures to the appendix. The task organization, the concept of operations, position area overlays, the survey plan, the list of registration points, the list of target numbers, and other lengthy documents may be published as tabs or inclosures. Whenever possible, reference is made to the existing SOP.

7–10. Fire Support Planning and Coordination

a. General. An amphibious operation is inherently naval in character; therefore, a naval officer, the joint amphibious task force commander (CJATF), is responsible for the preparation of the overall plan for the operation to include the fire support annex. The CJATF is also responsible for the coordination of all supporting arms until such time as the landing force coordination agencies are established ashore, and responsibility for fire support coordination passes from the CATF to the landing force commander (CLF). The CJATF discharges his fire support planning and coordination responsibilities through a supporting arms coordination center (SACC) established on his flagship. The staff officer responsible to the CJATF for fire support planning and coordination is a naval officer and is designated the supporting arms coordinator (SAC). The functions of the SACC and SAC parallel those of the fire support element (FSE) and the fire support coordinator (FSCOORD).

b. Supporting Arms Available to the Landing Force. At all times, one or more supporting arms will be available to the landing force and its assault elements for attack of targets. Normally, field artillery is not available to support troops in the initial phase of the amphibious assault. Therefore, fire support is provided by air and naval gunfire. After the early landing of field artillery, support is delivered by all three arms. Except for such objectives as islands or peninsulas, naval gunfire will not continue to be available throughout the operation and, because of the distances involved, may not be able to support the objectives of airmobile forces in the initial phases of the operation. Aircraft are limited by conditions of weather and visibility and by certain conditions of terrain, as in normal land warfare.

c. Fire Support Planning Responsibilities.

(1) The joint amphibious task force commander is responsible for—

(*a*) Coordinating the planning for the employment of all air, naval gunfire, and field artillery support.

(*b*) Preparing coordinated naval gunfire and air fire support appendixes for all phases of the operation.

(*c*) Planning for the establishment of a supporting arms coordination center at each appropriate level in the joint amphibious task force upon arrival in the objective area.

(2) The landing force commander is responsible for—

(*a*) Establishing, at the beginning of the planning phase at each appropriate level of the landing force, a fire support agency for the discharge and implementation of landing force coordination responsibilities throughout the planning and execution phases of the operation.

(*b*) Determining the air, naval gunfire, and field artillery support requirements of the landing force, and insuring that the requirements are integrated with the planned maneuver of the troops.

(*c*) Coordinating the requests for field artillery, naval gunfire, and air support for the landing force.

(*d*) Presenting coordinated requests for naval gunfire and air support to the joint amphibious task force commander.

(*e*) Preparing the field artillery fire support appendix.

(*f*) Disseminating pertinent portions of the joint amphibious task force naval gunfire support appendix and air fire support appendix to elements of the landing force. Normally, this is accomplished by publishing naval gunfire and air

fire support appendixes to the landing force fire support annex.

d. Fire Support Planning and Coordination Procedures.

(1) *Planning procedures.* Upon receipt of the initiating directive, liaison is established among the naval, air, and landing force troop commanders involved at each level of command. Field artillery, naval gunfire, and air officers on the staffs of all commands involved must be kept fully informed of the status of planning.

(2) *Fire support requirements.* The CLF submits to the CJATF his consolidated requirements for air and naval gunfire to support his scheme of maneuver ashore. The CJATF consolidates these requirements with the naval requirements for fire support and compares the overall requirements with the fire support means made available in the initiating directive. Based on this comparison, the CJATF allocates the ships and aircraft. If the fire support requirements cannot be met, the CJATF must request more ships and aircraft or request the CLF to reevaluate his fire support requirements.

(3) *Fire support coordination afloat and ashore.* The fire support coordination agency (FSE/FSCC) functions throughout the execution of fire support activities. Supporting arms representatives in the FSE/FSCC plan and coordinate fires, integrate the fire support means with each other and with the support elements of the landing force, and implement restrictive measures as required. These tasks are performed under various conditions and situations during the period afloat and after establishment of the FSE/FSCC ashore. While afloat, the FSE/FSCC operates in conjunction with the supporting arms coordination center (SACC) and reviews the requests of landing force elements ashore, monitors the fire support activities, and plans additional requirements. The FSE/FSCC representatives in the SACC make appropriate recommendations regarding troop safety and the type and means of delivery, and record all target information for future reference ashore. The planning of additional fire support requirements by landing force representatives in the SACC is accomplished concurrently with the execution of previously planned and scheduled fires to insure adequate and effective fire support of tactical operations ashore. With the approval of the CJATF, the control of supporting arms is passed to the landing force commander on installation of the landing force FSE/FSCC elements ashore. When control and overall responsibility for coordination are passed ashore, the CLF becomes responsible for the overall planning, coordination, and control of fire support means available in the objective area, and the SACC will operate in a monitoring status.

7–11. Embarkation Planning

Planning considerations for embarkation are discussed in FM 60–30. The principles involved in the embarkation of field artillery in amphibious operations, as discussed in paragraph 7–12*b*, supplement the embarkation planning considerations set forth in FM 60–30. Embarkation requires careful attention to detail in planning and execution.

7–12. Organization for Embarkment

a. Definitions (FM 60–30)

(1) *Embarkation team.* An embarkation team consists of the troops, equipment, and supplies embarked in a single ship. Field artillery weapons, prime movers, and weapon crews are loaded on the same ship to facilitate training and maintenance while underway. Field artillery to be landed by airmobile means should be loaded aboard the amphibious assault ship with the supported maneuver unit. Units must be loaded in a manner which permits unloading according to the tactical plan.

(2) *Embarkation unit.* An embarkation unit consists of two or more embarkation teams and is usually built around the field artillery organization of the division. If the landing force is a corps, embarkation units may be necessary for corps artillery as well as for division artillery.

b. Principles of Embarkation. The following principles apply to the organization of field artillery units for embarkation and to the execution of the embarkation:

(1) Field artillery organizations are normally formed together for embarkation. Field artillery units attached to other organizations of the landing force are embarked with the unit to which attached.

(2) When nondivisional landing force field artillery units are attached to the division for embarkation, they normally are specifically attached to the division artillery for embarkation.

(3) Regardless of the organization for embarkation and combat, the following personnel are embarked with elements of the landing force as indicated:

(*a*) The fire support element/fire support coordination center personnel are embarked with the supported maneuver commanders.

(*b*) Field artillery air observers and pilots are normally embarked in the ships transporting the artillery observation aircraft.

(*c*) Liaison teams provided to support maneuver units are embarked with the headquarters of these units.

(*d*) Forward observer teams are embarked with the maneuver units which they normally support.

7–13. Embarkation Shipping Requirements

a. General. The estimate of field artillery requirements (para 7–7) provides the basis for the preliminary determination of shipping requirements. The final shipping requirements are determined by the field artillery unit commander, based on the landing plan and the embarkation data submitted by the field artillery units. The final shipping requirements for field artillery are included in the totals of shipping requirements for the landing force and are presented to the joint amphibious task force commander.

b. Loading Details. Details for loading should be obtained from pamphlets which describe the characteristics of the ships. As early as possible in the planning phase, the stowage areas, hold, and decks should be inspected to insure that embarkation data is correct.

c. Loading Plan. The team embarkation officer, under the supervision of the embarkation team commander and assisted by the ship combat cargo officer when possible, prepares the loading plan. The embarkation team commander and the ship's commanding officer approve the loading plan before loading commences; they approve changes to the plan before the changes are effected.

(1) *Airmobile field artillery.* Airmobile field artillery normally should be embarked in landing platform, helicopter (LPH) or amphibious transport, dock (LPD)-type ships.

(2) *Waterborne field artillery.* The types of vessels normally used to embark waterborne field artillery are listed in descending order of preference: LST (landing ship, tank), LSD (landing ship, dock), LPD (amphibious transport, dock), LCU (landing craft, utility), LCM (landing craft, mechanized), LVTP (landing vehicle, tracked, personnel). Two additional ships, the LPA (attack, transport ship), and the LKA (attack cargo ship) are not normally used by field artillery unless limitations dictate otherwise.

7–14. Embarkation of Firing Units

The organization for embarkation should preserve the tactical integrity of the task unit as established in the organization for combat, and should facilitate their entry into combat. Direct support field artillery elements and attached field artillery are embarked with the units they are supporting. Batteries and battalions in general support are usually organized as separate embarkation teams to facilitate control. Dispersion of firing elements in assault shipping provides a measure of security against losses at sea. This dispersion should be carried out only to the extent that control of units is not unduly hampered or that tactical integrity is not lost.

a. Loading Considerations. The following considerations should receive special attention in the preparation of embarkation plans:

(1) Material must be accessible for maintenance.

(2) Prime movers should be stowed with the field artillery pieces.

(3) Slings for field artillery pieces and vehicles must be carefully adjusted to prevent damage to the equipment.

b. Landing Considerations. Early entry into action is insured by embarkation of light field artillery on LPH's for movement ashore by helicopter or by preloaded vehicles or craft. For surface landing, the early beaching of landing ships provides the most efficient entry into action. Medium and heavy field artillery units can normally enter combat at the required time by landing from LST's that have been beached or married to a causeway. Flexibility is necessary. The following considerations should receive special attention:

(1) Reconnaissance parties must be landed early.

(2) The composition of the reconnaissance parties should provide for the establishment of survey control and communications, the selection of position areas and beach exits, and the employment of route guides and markers.

(3) Firing units and fire direction and command elements should be loaded to expedite emplacement and provide centralized fire direction at the earliest possible time.

(4) Organic elements such as survey, meteorology, and radar must be embarked to provide for their earliest employment.

(5) Adequate security and control must be provided for movement from the beach to position areas.

(6) Plans must include measures to insure rapid off-loading and prevent overcrowding of the beach area.

(7) Alternate assembly areas and position areas must be planned.

7–15. Rehearsal for Employment of Field Artillery

The purpose of a rehearsal is to test the adequacy of the landing plans, the timing of detailed operations, the combat readiness of participating forces, and the adequacy of communications; and to insure that the participating units are familiar with the operation.

a. Planning. Planning should insure that the rehearsal will accomplish its purpose.

b. Briefing. Prior to the rehearsal, detailed briefings should be held to insure thorough understanding of the field artillery support. Field artillery personnel, such as observation and liaison teams who are embarked with other units, must be briefed prior to the embarkation.

c. Type of Rehearsal. The type of rehearsal conducted will determine what elements, personnel, and materiel will participate. Integrated rehearsals normally include field artillery personnel at all levels. During the rehearsal, field artillery communications are tested between forward observers, between the field artillery command groups, and between the fire support coordination and fire direction agencies. Normally, field artillery weapons are not landed during the rehearsal.

d. Critique. Primary consideration is given to an evaluation of communications, special techniques, and time space factors. If the critique is conducted ashore, it is advisable to include the field artillery forward observers and liaison (fire support) officers. This will enable them to be fully aware of any changes in the field artillery plans, and should give them the opportunity to provide additional information.

7–16. Movement to the Objective Area

The movement to the objective area is that period of time between departure of the amphibious task force from the ports of embarkation to the arrival of the components of the amphibious task force in their assigned positions in the objective area.

a. Communications Security. Radio silence is normally imposed during movement to the objective area. Communications restrictions impose severe limitations on the field artillery commander since he will not possess organic communications with personnel embarked in other shipping. Field artillery personnel must be thoroughly briefed on communications security prior to the time of embarkation, and they must be given adequate opportunity to test organic equipment and nets prior to the landing.

b. Training. Emphasis is placed on combat indoctrination and briefings in all aspects of the operation. Physical drills should be conducted daily to the extent the ship's facilities will permit. Field artillery personnel should be briefed on the landing plan, the scheme of maneuver ashore, locations of field artillery position areas, zones of fire, and road networks. Dominating terrain features that may provide orientation, suitable locations for field artillery installations, or a degree of protection from enemy fire and observation should be stressed. Technical training should be conducted commensurate with the space and facilities available to the field artillery unit.

c. Maintenance. Equipment and materiel must not be allowed to deteriorate during the movement; carefully supervised maintenance is performed throughout the movement. Dampness and salt water require that special care and cleaning be given weapons, communications equipment, vehicles, and supplies while the ship is underway.

d. Discipline. Discipline must be enforced during the movement. However, disciplinary problems are normally of minor consequence during the movement to the objective area.

e. Intelligence. During the movement to the objective area, the commander and his staff continually review the plan of operations and the plan for fire support. Current intelligence is provided by reconnaissance activities, the supporting arms coordination center (SACC), and higher headquarters. Recommendations for changes in the field artillery support must be made in light of intelligence relating to the characteristics of the objective area, the enemy situation, and enemy capabilities or as dictated by modifications to the scheme of operations. Planning for the destruction of additional targets and the elimination of targets to be destroyed by other fire support means are accomplished on the basis of target assessment information provided by the SACC representative. A continued program of counterbattery intelligence should be carried out at all levels of field artillery in order to provide adequate counterbattery measures and to determine

the appropriate tactical disposition of firing units. Review of the field artillery support in respect to any foreseen eventualities and the action that would be necessitated is made throughout the movement to the objective area. Loss of shipping with field artillery units embarked requires reassignment of tactical missions and modifications to the landing plan.

7–17. Arrival at the Objective Area

a. General. Field artillery units are landed as soon as conditions on the beachhead or landing zone permit. Reconnaissance parties must be permitted time to complete essential tasks before firing elements are landed. Field artillery units supporting waterborne assault units are landed on call in most operations, thus giving the field artillery commander flexibility in determining the actual time of landing. On-call field artillery is normally landed on order of the landing force commander based on the recommendation of the field artillery commander.

b. Ship-to-Shore Movement. Field artillery units should be prepared for an early landing and entry into action; however, they must not be landed until position areas are cleared of any small-arms fire that could prevent the delivery of continuous fire support for the assault units. Certain field artillery personnel, such as forward observer and liaison (fire support) officers embarked with the supported maneuver organization, must land prior to the field artillery weapons. Reconnaissance parties, including survey and communications personnel sufficient to expedite the reconnaissance, selection, and occupation of position, are scheduled early in the landing sequence of field artillery elements.

(1) *Waterborne Field Artillery.* The time of landing field artillery units depends on such variables as the availability of position areas, the requirements for field artillery ashore, and the ability to beach the larger landing ships. The exact place of landing is contingent on such factors as beach conditions, beach exits, and road nets to the position areas. The normal sequence of landing is discussed in (*a*) through (*d*) below.

(*a*) *Observers and liaison (fire support) officers.* Forward observers land with the rifle companies, and fire support officers/liaison personnel land with the battalion and brigade landing team command groups. The observation and fire support officer/liaison elements keep the appropriate artillery commanders informed of the situation ashore, including the locations and suitability of landing beaches, the locations and conditions of exits from the beaches, and the condition of preselected position areas. They make appropriate recommendations to the field artillery commander.

(*b*) *Reconnaissance elements.* Field artillery reconnaissance parties are landed as early as the tactical situation ashore permits. These parties are composed of battery and battalion commanders, communications personnel, survey personnel, guides, and sufficient personnel to provide initial local security.

(*c*) *Firing elements.* As soon as possible, battery and battalion commanders request that their units be landed. To insure early entry into action, commanders must estimate the time and space factors involved and initiate their requests in advance of the anticipated time the position areas are expected to be suitable for occupation.

(*d*) *Headquarters and headquarters and other elements.* After the firing units are ashore, the vehicles, supplies, and personnel still afloat are phased into position areas and command posts as soon as practicable.

1. Communications. The normal nets used in the displacement of a unit ashore are sufficient to control the ship-to-shore movement.

2. Ammunition. Ammunition is initially delivered directly to the firing units. Designated amphibious vehicles, after landing the firing units, may be utilized to transport ammunition directly from the ships to the position areas.

(2) *Airmobile Field Artillery.* Airmobile field artillery employed in amphibious operations is normally attached to the supported infantry in order to facilitate planning and execution. The sequence of landing airmobile field artillery elements is discussed in (*a*) through (*d*) below. The techniques of employing airmobile field artillery in amphibious operations are similar to those of employing airmobile artillery in operations ashore.

(*a*) *Observers and liaison (fire support) officers.* Forward observers and liaison (fire support) officers land with the supported maneuver units.

(*b*) *Reconnaissance elements.* The reconnaissance party must land as early as possible and is usually included in one of the early helicopter waves.

(*c*) *Firing elements.* Firing units may be landed on call or according to a schedule as in an airmobile operation. The field artillery commander may recommend that the landing of his units be delayed or moved up according to the

situation in the landing area. Alternate landing zones and position areas are considered to prevent delay in the delivery of fire support.

(*d*) *Other elements.* The remaining elements are landed as soon as practicable and as the tactical situation permits.

1. Communications. The field artillery commander does not have adequate internal communication means to control the unit during the airmobile movement. However, the airmobile movement is of relatively short duration and the limitation on communications is acceptable. Navy and landing force ship-to-shore communications provide for the requisite degree of control.

2. Ammunition. Priority is given to the movement of an adequate initial supply of ammunition. Resupply is effected by helicopters until the specified level is reached. The ammunition level is maintained by timely request or by automatic resupply by helicopter. Additional quantities of ammunition are palletized in helicopter loads and are ready on an on-call basis aboard the LPH or any designated amphibious supply point in the beachhead. Ammunition is delivered directly to the firing unit by helicopter until ground transportation is available to the field artillery unit for moving it.

3. Transportation. Airmobile operations normally limit the amount of organic transportation that can be lifted. The supported airmobile force to which the field artillery unit is attached should be aware of the transportation requirements and provide such additional means that may be within the landing force capability. When linkup operations are contemplated, organic field artillery transportation, equipment, and personnel that were not helicopter lifted into the area of operations are brought overland.

c. Control. Control of field artillery is decentralized at the time of embarkation and remains decentralized during the movement to the objective area. Preparations must be made for the resumption of centralized control as soon as practicable after arrival in the objective area.

(1) *Ship-to-shore phase.* At the appropriate time after completion of his reconnaissance, the field artillery battalion commander, using the division artillery command net, contacts the division artillery commander and requests that his battalion be landed. The firing units of the battalion, which are still afloat, and the field artillery representative in the tactical-logistical (TACLOG) group monitor the division artillery command net; thus, the field artillery battalion commander's request alerts the firing units and the TACLOG group to initiate preparations to land. The order to land emanates from two sources. The landing force commander issues the order (authority may be delegated to the landing force artillery commander) through channels to the subordinate commanders and to the field artillery representative in the TACLOG group, and the amphibious task force commander issues the order to the control ship and the ships in which the firing units are embarked. The TACLOG group then coordinates the actual landing with the appropriate naval control officer.

(2) *Nonscheduled units and supplies.* Control of the landing of nonscheduled units and supplies may be decentralized to permit subordinate commanders to send requests directly to the shore party to land nonscheduled field artillery units and supplies. The shore party relays these requests to the TACLOG group, and the TACLOG group notifies the appropriate naval control officer. The naval control officer issues the necessary order to land the nonscheduled units and supplies.

(3) *Initial control ashore.* Direct support artillery is the first field artillery to land. The need for centralized control by the landing force field artillery commander is not significant during this period; therefore, decentralized control is dominant in field artillery tactics and techniques during the initial stages of the landing.

(4) *Subsequent control ashore.* To provide centralized control of firing units after the initial stages of the landing, it is necessary that the parent unit fire direction center land early, preferably at the same time that the units which it controls land. As the general support field artillery units land, the need for centralized control of field artillery increases. The parent unit fire direction centers (force, group, and division artillery) are established ashore as rapidly as the situation will permit. The degree of centralization is influenced by the capability to communicate and mass fires, and by the tactical missions of subordinate elements.

7–18. Initial Employment Ashore

The initial employment of field artillery ashore is influenced by limitations imposed by the terrain, the compact position areas, and the proximity of multiple tactical and support installations. Detailed information concerning gunnery is required to insure accuracy and to facilitate the massing of fires. The following gunnery and tactical considerations are evident:

a. Fire Direction. Initially, the battery and possibly the battalion, fire direction center is the highest echelon capable of exercising centralized control of fire direction. Centralized fire direction is established by the parent unit at the earliest opportunity. Fire direction is facilitated by the proximity of subordinate firing elements and the resultant good communications.

b. Zones of Fire. Zones of fire are assigned to insure coverage of the entire front and to permit the massing of fires in critical areas when necessary.

c. Position Areas. The initial position areas are selected from careful map and photo reconnaissance. The primary consideration in the selection of initial position areas is that each unit must be capable of executing its assigned mission. Alternate position areas are selected and planned in the event the primary position areas cannot be occupied.

d. Gunnery Control. Detailed gunnery information is provided to subordinate units in appendixes and SOP's.

e. Reconnaissance. Field artillery commanders of all echelons involved in amphibious operations employ larger reconnaissance parties in the initial phase ashore than in subsequent phases.

f. Target Information. The field artillery representative to the Navy supporting arms coordination center provides the field artillery commander with target information and target assessment. During the initial phase, the targets located and fired on are coordinated through the supporting arms coordination center. All target information is passed to the fire support element/fire support coordination center so that the activity will have a complete record and target file when control is passed ashore. In addition, all Navy and landing force intelligence agencies and sources are utilized to locate potential field artillery targets. A target list is distributed by the amphibious task force and is supplemented by current target bulletins. The fire direction centers and the fire support elements/fire support coordination centers keep their target lists current by use of the periodic bulletins, by liaison with the intelligence agencies, and by close examination of damage assessment reports. Organic field artillery target acquisition agencies are emplaced and begin functioning as soon as possible.

g. Observation. Field artillery air observers must use ship-based aircraft until Army observation aircraft are located in the beachhead.

h. Naval Gunfire. Close coordination is of particular significance in the initial phase when field artillery has not yet been landed and increased reliance must be placed on naval gunfire support to meet troop requirements for close supporting fires.

i. Counterbattery. During the early period of the amphibious assault, the division artillery commander/field artillery battalion commander may be assigned sole responsibility for counterbattery activities. When the landing force field artillery headquarters begin functioning ashore, counterbattery activities are conducted primarily at division and corps levels as in normal land warfare.

7-19. Subsidiary Landings

a. General. The inability of field artillery to support the initial amphibious assault constitutes its greatest limitation. When possible, the installation of field artillery on off-shore islands or promontories for support of landing operations is desirable. Subsidiary landings for the purpose of seizing suitable position areas may be conducted when such islands or land areas are located within field artillery range of hostile defenses. Subsidiary landings are planned and conducted with the same precision as the main landing.

b. Subsidiary Landings Prior to Main Landing. When subsidiary landings are conducted prior to the main landing, the element of surprise is generally sacrificed; however, the additional fire support may contribute a greater measure of assurance of success to the amphibious assault of the beach. This is particularly true when insufficient naval gunfire is available or when gunfire support ships are lost during the critical assault phase.

c. Subsidiary Landings Subsequent to Main Landing. When subsidiary landings are conducted subsequent to the main landing, either ship-to-shore or shore-to-shore techniques may be used. Seizure of position areas for the field artillery is desirable to provide support not otherwise available, to deny these areas to the enemy, to deceive and demoralize the enemy, and to lend impetus to the attack by the landing force.

d. Planning Subsidiary Landings. Diversion of elements of the landing force for subsidiary landings is justified when the value of the subsidiary operations is more significant than the contribution these elements would make to the main land-

ing or attack. Plans for displacement and resupply of field artillery occupying position areas seized in subsidiary landing operations and for linkups with elements of the main landing force must be initiated to insure continuous and uninterrupted fire support for the main landing and subsequent operations ashore. To preclude loss or reduction of field artillery support during the period of displacement, i.e., the time necessary to embark, land, and emplace the units involved, the landing force commander may include in the field artillery organization for combat the necessary additional units to participate in foreseeable subsidiary landings.

7–20. References

For additional details on amphibious operations to include administrative planning, refer to FM 31–11, FM 31–12, and FM 60–30.

Section III. NIGHT OPERATIONS

7–21. General

The fundamentals of fire support are applicable during periods of reduced visibility. However, operational techniques must be modified to allow for the inherent capabilities and limitations of available fire support elements (field artillery, mortars, naval gunfire, tactical air, armed helicopters) during periods of darkness. The problems associated with mobility, target acquisition, and fire support coordination are increased during periods of darkness. Proper employment of night operational techniques, night vision aids, and target acquisition equipment will increase the effectiveness of night operations.

7–22. Fire Support Coordination

Fire support coordination techniques apply equally during daylight and darkness. The visual control and navigation problems during periods of darkness increase the requirement that unit locations be reported, posted on battle maps and firing charts, and continually verified. Field artillery and mortars or naval gunfire may be used as navigational aids. Available night vision, ground surveillance, and illumination means may be used to identify boundaries, checkpoints, limits of advance, and target locations.

7–23. Field Artillery (Mortar) Unit Operations

a. General. Night operational techniques are applicable to all field artillery and mortar units. A detailed discussion of movement and of reconnaissance, selection, and occupation of position is contained in chapter 4, FM 6–140. Unit SOP's must include details for all phases of night operations.

b. Displacement. Fire support units are prepared to displace under all conditions of visibility to support the ground tactical plan. Unit SOP's must include the techniques of blackout driving and operation of available night vision equipment such as electronic binoculars and metascopes. Airmobile units prepare the SOP for heliborne operations during periods of reduced visibility.

c. Night Occupation and Organization of Position, (FM 6–140).

7–24. Adjustment of Fire

a. Adjustment of field artillery and mortar fires and naval gunfire during daylight reduces the need for adjustment at night. Adjustment techniques used in dense jungle and rugged terrain are applicable at night. All observers must become proficient in techniques which will aid them during periods of reduced visibility; that is, adjustment by sound, adjustment under illumination, and utilizing WP shells as marking rounds. Available active infrared devices may be used to signal other friendly elements or aerial observers. Each type of night vision aid may be employed to assist in surveillance, navigation, and target acquisition.

b. The aerial observer has the same basic problems at night as the ground observer. Through the use of available searchlights with both visible and infrared illumination, illuminating projectiles, and flares, the aerial observer can more easily detect enemy activities. Using night vision devices, he can often increase his observation capabilities, although vibrations and reflections from aircraft windows create difficulties with this equipment. The aerial observer is often invaluable as a radio relay at night. A thorough map reconnaissance prior to takeoff is perhaps the aerial observer's greatest advantage during night observation.

c. The ground and aerial observers, using a common radio net, should work as a team to overcome their respective limitations. After locating friendly elements on the ground, the aerial ob-

server may "creep fire in" until the ground observer is able to spot the rounds and control the adjustment visually or by sound.

d. Construction and use of visibility diagrams (line-of-sight diagrams for radar operators) are useful at night to increase accuracy.

7-25. Fire Planning

a. Survey and registration should be completed during daylight hours, if possible. If a flash base can be established, a high-burst or mean-point-of-impact registration may be conducted after dark. All plans must be simple and well coordinated. The possibility of sacrificing surprise should be considered when planning any fires in support of a night operation.

b. Detailed fire planning is required for well-executed night operations. Harassing and interdiction (H&I) fires upset the operations of the enemy and reduce his mobility. Defensive targets should be adjusted prior to darkness on avenues of approach and gaps in fields of fire and observation.

c. Fires may be scheduled or placed on call during night operations to—

(1) Isolate the friendly zones of attack and the objective.

(2) Interdict likely ambush sites.

(3) Discourage the enemy's use of snipers and command-detonated mines.

(4) Protect the rear of a column from followers.

(5) Protect vulnerable flanks.

(6) Assist in navigation.

(7) Harass and interdict.

(8) Illuminate areas of concern.

d. Preparations often are not used at night, particularly when the supported attacking force is moving by stealth. However, deceptive fires often can be employed to interrupt the concentration of enemy defenders as well as cover any noise made by the attacking force. Preparation and blocking fires should be planned and be available on call. Often preplanned fires may be used on alternate objectives as deception to the enemy's confusion. When exact enemy locations are unknown, large areas may be reconnoitered by fire by use of zone and sweeping techniques by field artillery or mortars.

7-26. Countermortar/Counterbattery Fire

a. A detailed countermortar plan that can be rapidly executed is essential to defeat a night mortar attack in which large quantities of ammunition may be delivered in a short time.

b. The countermortar plan should include use of all available fire support means. Targets are plotted on possible mortar locations and on avenues of approach. Sectors of the area are assigned to the available fire support units, commensurate with their respective direction of fire and range capabilities. Should a mortar attack occur, all or portions of the countermortar program may be fired by target or assigned sector. The direction from which the mortars are firing will indicate which portions of the countermortar program should be fired. The actual or suspected locations of enemy mortars should be immediately engaged.

c. Available radars, observation posts, and listening posts are coordinated to report incoming rounds, flashes, or sounds of firing. Personnel must be proficient in rendering shell reports. Appropriate communications are established to reduce delays. Often friendly field artillery and mortar fires create clutter for radars and confuse observers. A technique to rapidly check which units are firing should be established. An aircraft should be kept on alert so that it may be airborne in time to detect muzzle flashes of enemy mortars. All countermortar plans must be coordinated and tested to insure minimum reaction time.

7-27. Aerial Fire Support

The employment of tactical air, attack helicopters, and aerial field artillery in support of night operations requires detailed planning and coordination because of the difficulties in target identification, location of enemy troops, and control. Cannon field artillery and mortars generally are preferable for close support during periods of reduced visibility.

a. All available illumination and night vision devices, tracers fired straight up on each flank of units, and radars should be considered for employment in determining the locations of friendly troops and in identifying targets. Once the pilot or forward air controller (FAC) identifies the friendly locations, a target may be designated by an azimuth and distance (polar plot) from an easily identifiable point. Care should be taken not to disclose friendly positions. Searchlights, illumination rounds, and air-dropped flares aid in troop and target identification and control. Detailed planning and coordination is essential to preclude

blinding pilots or unnecessarily sacrificing security.

b. The starlight scope, mounted on a rifle or machinegun, may be used by helicopter door gunners or observers to acquire and engage targets. The targets are marked by tracer rounds for further engagement by other armed aircraft.

c. Searchlights and floodlights may be attached to helicopters to facilitate the employment of armed helicopters at night.

7–28. Nuclear and Chemical Fires

The employment of nuclear and chemical fires in support of night operations is basically the same as in support of daylight operations. However, loss of surprise and the adverse effects of nuclear and chemical weapons should be considered in greater detail. Problems peculiar to night operations in a nuclear or chemical environment are obstacles, dazzle, loss of night vision, decreased command and control, diminished effective use of optical equipment while wearing the protective mask, and target acquisition. A detailed discussion of the employment of nuclear weapons is contained in the FM 101–31-series. The FM 3–10-series contain detailed information on the employment of chemical weapons.

Section IV. MOUNTAIN OPERATIONS

7–29. General

The standard artillery units of corps and divisions can operate successfully in mountains, although mountain warfare imposes special problems concerning mobility, fires, communication, and tactical employment (FM 100–5). Personnel working in high altitudes require more frequent rest periods because of the decreased oxygen in the air. Commanders must consider this additional time factor when planning for mountain operations. This section summarizes the problems which require particular attention in mountain operations. See FM 31–71 and FM 31–72 for details on artillery operating in mountains.

7–30. Mobility

The surface movement of field artillery in mountainous terrain is generally restricted to roads and improved trails. In mountainous areas, the scarcity of adequate roads and trails limits the choice of avenues of approach to the extent of canalizing the movement of field artillery. In addition, the winding roads and steep slopes characteristic of mountainous areas create difficulties in turning towed weapons and in getting them into and out of positions. Towed light weapons can sometimes be manhandled under these conditions. Subject to density altitude limitations, helicopters can be used to transport towed light and medium field artillery into areas that have no access roads. Self-propelled weapons, though able to negotiate sharp turns and go up or down steep slopes, are hampered by tracks slipping on icy roads. This can often be overcome by the use of grousers (cleats) on the tracks of vehicles.

7–31. Conduct of Fire

a. Field artillery fire is not as flexible in mountainous terrain as on the plains, because the choice of positions is restricted and masks are high. However, howitzers are well suited to mountain warfare because of their arcing trajectories. High-angle fire is employed frequently to reach over masks, behind crests, and into deep valleys. Adjustment of fires on targets located on peaks and reverse slopes is difficult. Guns, with their flat trajectories, cannot be used close to the front except in direct fire roles. Normally, guns are employed far enough to the rear to take advantage of an increased slope or fall. Some weapons may be moved forward to provide long-range interdiction fires.

b. Most field artillery fires in the mountains must be observed, especially fires close to troops and defensive fires. Observation parties may require augmentation to assist in carrying equipment. Aircraft and helicopters increase the range of observation and permit searching of areas into which ground observers cannot see.

c. Unobserved fires are generally unreliable in the mountains. Meteorological conditions change rapidly, and registration corrections for high-angle fire are valid for only short periods. Effective transfer of fires is difficult, since altitudes within transfer limits vary greatly. Often, a check round should be fired in the vicinity of a target before fire for effect is delivered on the target.

7–32. Ammunition

Impact, high-explosive ammunition is effective in rocky ground, since it scatters stones which

become missiles. However, protracted bombardment of defensive positions in the mountains with impact explosives produces few enemy casualties. Fires may be used to initiate rockslides or snowslides to block supply routes or engulf enemy defenses. Variable time and time fuzes are effective, particularly against enemy troops on reverse slopes. Smoke is used but is difficult to control because of winds. Information concerning nuclear weapons effects in mountains is contained in the FM 101–31-series. The FM 3–10-series contain information concerning chemical weapons effects.

7–33. Targets and Target Locations

a. Passes and defiles which form bottlenecks in the enemy supply route are ideal targets for field artillery interdiction fires. Since the defender is usually dispersed in small groups, massed fires of many weapons are seldom effective and are expensive.

b. Direct observation by ground or aerial observers is the most reliable means of locating targets in the mountains. Ground observers may be restricted in observation by the next hill mass. Deep defilade makes it difficult to locate enemy weapons. Army aviation should be used to search areas defiladed from ground observation. However, high-performance aircraft have difficulty performing observation missions while avoiding mountain hazards. Much reliance must be placed on shell reports because of the inefficiency of radar and sound ranging equipment in the mountains. Radar surveillance is adversely affected by ground clutter, and sound ranging is difficult because of echoes. Maps and aerial photographs disclose probable weapon locations, since the enemy is also restricted by terrain limitations in his choice of gun positions. Deep shadows and uneven illumination increase the difficulty of interpreting aerial photographs. Countermortar and counterbattery radar, when properly positioned, are particularly effective since much of the fire will be high angle.

7–34. Control

Terrain compartmentation often requires the use of multiple maneuver columns in the attack. Small forces require field artillery support. Decentralization of control of field artillery may be necessary to provide support for all columns. Elements of general support units may be detached in order to provide support for units that are separated by terrain features. However, this procedure tends toward decentralization and loss of control, and should not be used unless absolutely necessary to provide field artillery support.

7–35. Communications

Main wire routes are restricted to roads, and wire lines are vulnerable to breaks caused by enemy artillery or friendly traffic. Cross-country wire is difficult to maintain and is often broken by rockslides and snowslides. The use of Army aircraft to lay and maintain wire during mountain operations aids in solving this problem. Radio communication is used extensively. Care must be exercised in the selection of sites for antennas of very-high-frequency sets. This does not apply to the AM equipment presently used by field artillery which operates from 2.000 to 29.999 Mc. Field artillery radio equipment, operating in the tropospheric scatter mode (FM), requires special attention for effective siting. This must include topographic analysis and pathplanning. The use of relay stations (either ground or air) is prevalent in mountainous terrain. For more detailed information on field artillery communications, see FM 6–10.

Section V. JUNGLE OPERATIONS

7–36. General

Jungle combat is designated a special operation primarily because the inherent difficulties of terrain, climate, and visibility in the jungle complicate the vital problems of command, control, movement, communications, supporting fires, target acquisition, supply, and evacuation. Normal procedures may be modified, and specialized equipment may be required. Training for jungle operations includes thorough indoctrination on living in the jungle, personal hygiene, care of equipment, and the advantages and disadvantages of jungle warfare (FM 31–35). Areas requiring special attention by the field artillery command in support of jungle operations are mobility, observation, positions, fires, logistics, ammunition, communications, survey, and security.

7–37. Mobility

a. Conditions encountered in jungle operations impose greater restrictions on the movement of field artillery than those encountered in other

types of operations. Suitable roads and improved trails are almost nonexistent away from settled areas, and the few that do exist often become muddy quagmires. Roads must be constructed as the movement progresses; and, due to the lack of materials suitable for road construction, their use is usually limited to light trucks or light tracked vehicles. Dense vegetation, unstable soils, and poor drainage make road construction difficult. Roads must be continually maintained to insure continuous movement of vehicles and supplies, since jungle growth quickly reclaims neglected or abandoned roadways. Engineer support is required initially to establish a trail or roadnet of at least minimum standards. Carpenter's tool sets, portable power tools, and chain saws are particularly useful for clearing jungles and for road construction. Special equipment is needed to build roads that will withstand tropical conditions and carry heavy vehicles. Such equipment may include tractors capable of traversing boggy and swampy terrain; bulldozers for roadbuilding and for preparing positions; and, in some cases, boats for crossing rivers and flooded swamps and for displacing along shorelines and rivers. Other considerations are as follows:

(1) Aerial reconnaissance is a necessity in route selection. Aerial photographs effectively supplement maps and map reconnaissance. In addition, helicopterborne scouting parties may be used advantageously in route reconnaissance.

(2) The use of helicopters materially increases the mobility and flexibility of the field artillery in jungle operations by providing the batteries with a constant supply of ammunition and the lift capability to move from one firing position to another while bypassing impenetrable areas, (Para 7–65 through 7–70).

b. The rate of march for ground movement depends on the type of jungle terrain, the availability of trails, the transportation means, and the formations and security elements employed. If a dismounted march is required, march distance, obstacles, and the physical condition of the troops are considered in calculating the rate of march. The rate of march, the distance of march, and the number of rest periods are commensurate with the physical endurance of the men. Extreme temperatures make frequent halts necessary. During mounted marches, the rate of march, the march distance, the type of security formation, and the fire support available are the major factors considered.

c. Standard march security measures are applicable to jungle movements. However, distances between march elements are reduced and other security measures are intensified because of the reduced visibility and the natural obstacles. When a unit is operating independently, all-round security is necessary.

(1) Point security elements may proceed ahead of the advancing main column to reconnoiter all possible danger areas. Elements should include combat engineer teams.

(2) Flank security is a continuing requirement. During a mounted march, the only flank security available may be that provided by individuals with assigned weapons in the vehicles, aerial fire support, or fire support available to an airborne air observer assigned to assist the march element. When foot marches are required, flank security elements may have to cut their own trails and will experience difficulty in keeping abreast of the march column. In these cases, the security elements are rotated frequently, thus reducing the speed of the column. When the column is crossing danger areas, flank security elements may be employed to cover the crossing. If used, these elements rejoin their march units as soon as possible after the crossing is completed.

(3) Supporting weapons should be located in the column in such a manner as to be capable of supporting against any attack consistent with enemy tactics.

(4) During extended halts and, when possible, during short halts, units move off the roadway or trails and form a hasty perimeter. Precautionary measures should be taken against enemy mines. Security elements are posted in all directions. At least 50 percent of the unit is placed on alert. Halts for overnight bivouacs are made early enough to permit securing the bivouac area before dark.

(5) Preplanned on-call fires for execution by other field artillery or other fire support means may be developed and executed for specific target areas along the route of march. These are used in the event the column is attacked while marching.

d. Vehicle maintenance requirements increase because of the effects of humidity, precipitation, and high temperatures. These conditions cause an excessive number of spring failures, overheated engines, and electrical and fuel system failures, and cause rotting of canvas and corrosion of metal items. These adverse conditions also affect other items of equipment.

7–38. Observation

a. Observation is restricted by jungle growth

and is often limited to the immediate vicinity of the observer. Usually, the canopy in a primary rain forest, which consists of a virgin growth of mature trees, is so thick that it cuts off most sunlight and reduces visibility to 20 to 30 yards. Visibility may be limited to 5 yards or less in a secondary forest, which is composed of a growth that develops when the original forest has been burned off or cut. Rain, clouds, and the steamy exudation from wet areas also tend to reduce visibility. Because of limited visibility and lack of conspicuous landmarks, it is often difficult to locate a ground position from a map. By communicating and coordinating with available observation aircraft, forward observers may carry control to establish their exact location by several means such as compass, pacing, and resection.

b. Field artillery forward observer parties must be large enough to carry the equipment, provide security, and, if practicable, lay wire. They must be well forward but in close contact with the supported unit at all times. Since checkpoints and known locations are rare, observers must use initiative in devising methods of spotting fire. If the observer cannot see the burst, he may use the sound-spotting method. The observer must know the angle of fall of the projectile and the height of the trees in the vicinity of the target to prevent projectiles from bursting over friendly troops. Often, close-in targets can be engaged only through the use of high-angle fire. Some observation advantage may be gained from high trees and dominating terrain. Also, aerial observation from Army aircraft is effective in locating hard targets such as enemy batteries, troop concentrations, bivouacs, and boats. Often, it may be necessary to adjust fires using "creeping" techniques to insure the safety of supported troops.

c. Army aircraft can be profitably utilized in jungle warfare in adjusting fires, locating friendly lines and enemy bivouac sites, and spotting targets for airstrikes. Observers in aircraft can work as a team with ground observers in adjusting field artillery fires. Although the ground observer can hear the rounds detonate, he often cannot see the bursts, even though he can see the target; the air observer can see the bursts but may know only the approximate location of the target. A combination of their spottings (both visual and by sound) gives the fire direction center a better picture of the adjustment, and speeds up the delivery of effective fire.

d. Patrols are often an excellent source of target information.

e. Smoke and white phosphorus ammunition are often used to mark targets for airstrikes, and to assist in observation during adjustments.

f. The employment of surface target acquisition devices is generally restricted by tree canopy, lack of survey control, poor trails for moving heavy equipment, and the necessity for cleared fields of scan for the radar sets. When they can be installed, sound and flash ranging bases and radars can operate efficiently, though their range may be reduced.

7-39. Positions

Jungle vegetation makes the preparation of positions difficult because the required fields of fire for weapons must be hacked out of the jungle. When possible, the positions should permit a 6400-mil firing capability. In some cases, positions along streams, on beaches, or on adjacent islands may provide suitable fields of fire. Since natural fields of fire are generally limited to 5 or 10 meters and undergrowth is generally heavy, several days of labor may be required to clear 100-meter fire lanes around positions. This work is expedited by employing supporting engineers with portable power cutting tools and/or herbicides and defoliants. Care must be taken, in clearing fields of fire, to disturb the tree pattern as little as possible to avoid disclosing the positions to enemy aircraft. When possible, field artillery batteries occupy positions near roads or trails. In wet weather, roads into positions should be corduroyed and a firing platform built to support each weapon. In some positions, it may be necessary to emplace weapons on prefabricated weapons firing platforms which can be transported to the site by helicopter.

a. Field artillery units stress position security. Positions are normally more compact in jungle terrain than in open terrain. Positions are constructed to provide a 6,400-mil, all-round firing capability, with the weapons placed close together to facilitate control and security. The area is bounded by barbed wire set out beyond hand grenade range and supplemented with boobytraps, trip flares, and sharpened stakes. Lanes of fire for machineguns are cut in the form of tunnels through the jungle, and are made to interlock with those of adjacent machineguns. Combat outposts, listening posts, and patrols are usually required. If available, night vision equipment, illumination devices, and sensors should be used in the perimeter defense.

b. Within the position, paths or trenches should be cut to connect each howitzer section with other battery installations and with foxholes and/or fighting bunkers with firing ports which can be occupied to support the perimeter defense. Wire entanglements are placed around each howitzer section to prevent close-in grenade and bayonet charges and to preclude an enemy force from moving simultaneously and directly to all weapons. All personnel should have foxholes (preferably with overhead cover) readily accessible. At least two men must be alert at each howitzer at all times. A warning system is a matter of SOP.

c. When the mission permits, the direct support field artillery should be located within the area of the infantry reserve to take advantage of the protection provided by the riflemen. The cannon batteries of a battalion should be within range of each other to insure mutual protection and to retain the ability to mass fires on a common target. After each battery has established a perimeter defense, the defense system must be integrated into a battalion defense plan. Security must be stressed when displacing to new positions, since the jungle aids the enemy in preparing an ambush. The march security precautions discussed in FM 6–140 apply.

7–40. Fire Capabilities and Limitations

a. As in mountain operations, the delivery of accurate massed fires in jungle operations is difficult, and the flexibility of field artillery fire is reduced by high masks, scarcity of suitable positions areas, lack of accurate maps and survey control, and restricted observation. Direct fire missions may be required to defend positions against ground attack. Heavy and medium cannon field artillery may be used in a direct fire role to destroy caves and pillbox emplacements. Light field artillery may be used in the direct fire role to defoliate trees and destroy natural camouflage to expose hidden emplacements. High-angle fire may often be used to clear tall masks surrounding positions. Caution is exercised when adjusting all fires to insure that friendly troops are not injured by tree bursts.

b. Fire support and maneuver are interdependent; their planning and execution are more difficult in the jungle and must be closely coordinated. The procedures to accomplish the tasks involved in the coordination of fire support will vary with the headquarters, the volume and type of fire support available, and the type of operation.

(1) Long-range fires, close-in defensive fires, and fires within the position are planned and executed as in normal terrain.

(2) The proximity of units in jungle operations calls for extensive and detailed planning of final protective fires (FPF) and defensive targets.

(3) The control of fires of the infantry's organic weapons is decentralized to the extent required by the frontage of the unit, the terrain, and the limits of the higher commander's observation.

(4) Units whose defense areas are not under attack or whose fires are not required to support the area under attack may hold their fires so that their positions will not be revealed.

(5) The effects of jungle terrain on the efficiency of supporting weapons are always considered when planning for fire support.

c. The observer often adjusts fire on close-in targets by spotting the location of the burst through sound and then using the creeping method. When this method of adjustment is used, extra caution must be taken by both the observer and the fire direction personnel to guarantee accuracy. Observers with adjacent units can assist in the adjustment by giving their sound spottings.

d. Problems in control and communications often make decentralized control of field artillery unavoidable. As a result, batteries may be employed independently. In such situations, a more thorough reconnaissance is necessary in locating future positions and closer liaison is required with the supported unit. Jungle fighting erupts suddenly, and quick reaction of the field artillery is essential. During marches, a single piece near the head of the column may place direct fire on enemy roadblocks, tanks, or bunkers. Light field artillery is generally more appropriate for jungle warfare than medium and heavy field artillery because of the ease in handling and transporting. However, towed medium field artillery, which is transportable by helicopter, and heavy field artillery are invaluable because of their long-range capability, heavy volume of fires, and greater penetration capability.

e. Under tropical weather conditions meteorological data are generally not subject to rapid change; therefore, meteorological corrections are reasonably accurate.

7–41. Ammunition

a. Supply and storage of ammunition is a serious problem in the jungle. Since many missions

are fired close to friendly troops, sorting of ammunition must be carefully supervised to insure uniform lots. Ammunition must be stored with care to protect it from moisture, since exposed powder charges and metal surfaces deteriorate rapidly in the jungle humidity.

b. High-explosive (HE) shells are effective in the jungle. The choice of fuzes for HE shells is influenced by the nature of the vegetation. Antipersonnel ammunition (bee-hive) may be employed in a direct fire role in defense of the battery area. Smoke shells are used extensively in adjustment, because their bursts can be easily identified, and are useful in marking targets for airstrikes and for producing smokescreens. Chemical shells are effective in producing casualties among personnel in prepared positions and emplacements that are relatively invulnerable to other shells. A longer target exposure time to the effect of chemical agents results from low wind speeds and stable meteorological conditions under jungle canopy. Information concerning nuclear weapons effects in forests is contained in the FM 101–31 series. The 3–10 series field manuals contain information concerning chemical weapons effects.

c. Fuze quick is effective in areas of low tree canopy; it provides tree bursts at a desirable height and produces a bonus effect of splintering. VT and time fuzes are generally ineffective in areas of heavy tree canopy; the rounds are difficult to adjust, and much of the fragmentation effect is dissipated in the canopy. The performance of VT fuzes may be erratic because of excessive moisture.

7–42. Communications

a. Although radio communication in the jungle is highly desirable, especially in the attack, it is seriously affected by line-of-sight restrictions, dense vegetation, and adverse atmospheric conditions, resulting in a 40- to 70-percent decrease in the range considered normal in open or lightly wooded terrain. Radio operators are trained to copy weak signals and to use expedients in constructing and siting antennas. Remote control equipment may help in securing more favorable locations for radio sets. Aircraft can assist ground communications by acting as radio relay stations and making terrain surveys for radio relay sites. Helicopters can be used to transport personnel and equipment to selected sites, thus expediting the speedy installation of important circuits. Aircraft may also be used to supply communications personnel operating radio relay stations with rations, POL, and parts.

b. The limitations imposed by the jungle on other means of communication place greater emphasis on wire. Ground wire routes are limited, and the few available routes are normally heavily traveled, making overhead construction desirable. Helicopters may be used to lay wire rapidly over jungle canopies. In a fast-moving situation, maintaining wire communication may be difficult, and the vulnerability of wire lines to enemy sabotage and/or tapping for intelligence purposes increases.

c. Visual communications include the transmission of messages by flags, panels, and pyrotechnics. The use of visual communications is limited by the density of the jungle and the scarcity of areas suitable for their use.

d. Before the commencement of jungle operations, every possible measure is taken to dry out and protect equipment. The care of communications equipment is of special importance in the rainy season. It must be protected against fungus growth, insects, corrosion, and moisture. A treatment which can be used in the field consists of spraying or brushing on a moisture- and fungus-resistant varnish. The varnish should be applied prior to receipt of the equipment by the user, or prior to issue of the equipment for use in the jungle. Additional protection consists of waterproof covers, either issued or made from salvage material, and keeping the equipment off damp or wet ground.

7–43. Survey

a. Since adequate maps do not exist for most jungle areas, survey control should be established when feasible. Survey through jungle growth is a time-consuming and difficult operation. Though few survey control points may be available, survey control can usually be extended to individual forward observer and battery positions. Target area survey is usually restricted or impossible. Since line-of-sight (required for triangulation, resection, and trilateration techniques) is usually extremely short or nonexistent, traverse is generally the survey technique used for all but the target area survey.

b. When the tactical situation precludes the use of standard survey techniques (traverse, triangulation, astromic observation, or gyro azimuth surveying instrument techniques), survey control

may be extended by using one or a combination of the following: Radars, helicopters, and aerial photographs and photomaps (FM 6–2). Frequently, it is necessary to establish initial control by map-spotting and directional control by astronomic observation or by use of a gyro azimuth surveying instrument. However, the use of countermortar radars to determine horizontal control and simultaneous observation to extend directional control is usually more accurate than map-spotting.

7–44. Logistics

a. Logistic problems of the field artillery in jungle operations develop from the rapid deterioration of all classes of supplies, the difficulty in moving supplies, in keeping supply and distribution points close to elements on the move, and the increased need for preventive medicine. Supply economy on the part of each individual is rigidly enforced. Security of logistic installations is a continuing requirement, since jungle conditions are conducive to infiltration, guerrilla action, and raids.

b. Logistic requirements must be anticipated well in advance of actual needs, and provisions must be made for adequate storage of supplies and for issuing supplies to the user. Control of all classes of supplies must be closely supervised in order to exclude surplus and nonessential items. For maximum efficiency, all modes of transport should be used. Air transportation is an important means of supplying jungle operations. Emergency supplies can be airlifted when all other means of transport fail.

c. Although all equipment for use in the tropics must be capable of functioning efficiently in high temperatures, temperatures alone do not cause the greatest difficulties. Storage and supply problems of all items are compounded by the combined effects of jungle conditions.

Section VI. DESERT OPERATIONS

7–45. General

Field artillery techniques may be modified for operations in desert regions. Desert terrain varies from low, flat, sandy plains to high, rocky mountainous areas. Temperatures vary from torrid to subzero according to the latitude and altitude. Characteristics that are common to all desert regions are arid climate and a lack of vegetation. The principal problems confronting field artillery engaged in desert warfare (FM 31–25) are associated with observation and maintenance.

7–46. Observation

a. Ground observation of field artillery fires in hot, flat, sandy desert areas is difficult because of heat waves, mirages, lack of elevated positions, and frequent duststorms. Distances observed over flat terrain are deceiving and are usually underestimated. The absence of identifiable landmarks reduces the value of maps. Aerial observation, although more effective than ground observation, is also hampered by these factors.

b. Observation in mountainous desert areas is subject to the limitations discussed in paragraphs 7–29 through 7–35.

c. Because of the absence of natural camouflage materials, additional consideration must be given to camouflage in desert areas.

7–47. Maintenance

Because of the frequent duststorms and sandstorms, continuous intensive maintenance is required to protect all material from the abrasive action of the fine dust and sand. Wear on cannon tubes, slides, and all bearing surfaces, as well as scoring and pitting of optical instruments, are greatly increased in desert regions.

Section VII. COMBAT IN BUILT-UP AREAS

7–48. General

a. Most built-up areas can be bypassed without materially affecting the commander's plan of maneuver. Only built-up areas that occupy key terrain or that constitute islands of resistance so large as to be serious threats to future operations normally are attacked. Outlying areas which afford good fields of fire become the enemy's first line of defense. This line may be fortified with anything from hastily prepared positions to mutually supporting concrete emplacements. If the initial line of defense is penetrated, the defender

must fall back to the town. The attack of a built-up area is divided into the following three phases:

(1) Isolating the built-up area.

(2) Penetrating the defender's initial line of defense.

(3) Advancing through the built-up area.

b. FM 31–50 contains a detailed discussion of the phases of combat in fortified and built-up areas.

7–49. Field Artillery Support of the Attack

a. After the built-up area is isolated, the field artillery commander prepares to support the two remaining phases of the attack. In the second phase, which is to penetrate the defender's initial line of defense, control of the field artillery is centralized. The mission of the field artillery in the second phase is to destroy fortifications, neutralize enemy artillery, and provide interdiction fires. The forces holding the built-up area will normally have good observation, thus forcing friendly troops to displace at night or along concealed routes. With the successful completion of the second phase, the field artillery displaces quickly to support the third phase of the attack.

b. The third phase of the attack, which is to advance through the built-up area, is characterized by semi-independent action of small units, which attack through separate corridors of the built-up area. Control of field artillery in the third phase is frequently decentralized to provide support to the attacking units. Observation is usually poor, and field artillery must depend almost entirely on forward observers for conduct of fire. Communication with forward observers is impaired by buildings that interfere with the line-of-sight characteristics of field artillery FM radios. Direct fires should be delivered by self-propelled weapons and/or AFA with sufficient firepower to destroy designated buildings. Field artillery providing close support to attacking troops must be capable of high-angle fire. If opposing forces are close together, it may be necessary to withdraw the attacking forces while field artillery is being fired.

c. A built-up area that has been attacked with nuclear weapons may become a formidable obstacle and may provide an excellent defensive area; consideration should be given to the use of chemical weapons if destruction of buildings is not desired. The plan for employment of nuclear weapons against a town should provide for a relatively clear passage through some portion of the town; this portion should be attacked with chemical fires that produce negligible contamination. The enemy must be prevented from reoccupying the town after it has been attacked with nuclear weapons; chemical fires that produce significant contamination may be considered for use in this role. Further information concerning nuclear weapons effects against built-up areas is contained in the 101–31-series field manuals. The 3–10-series field manuals contain information concerning chemical weapon effects.

7–50. Field Artillery Support of the Defense

In the defense of a built-up area, field artillery is so emplaced or the AFA employed so that it can fire against hostile forces attempting to envelop or bypass the town. The supporting field artillery must be able to deliver the preponderance of its firepower on the critical avenues of approach, and to fire final protective fires on close-in approaches such as streets, open areas, and areas containing lightly constructed buildings. If the enemy makes a penetration, the field artillery must be able to deliver the preponderance of its firepower against the penetration and to support the counterattack.

Section VIII. RIVER CROSSINGS

7–51. General

Wide, unfordable rivers have considerable influence on military ground operations because they impose restrictions on surface movement and maneuver. They constitute obstacles to attack and afford natural lines of resistance for defense. The maximum use of AFA should be considered. For details of river-crossing operations, see FM 31–60.

7–52. Field Artillery Support of the Crossing

a. A surface crossing is supported from positions as far forward as secrecy permits. These positions are occupied under cover of darkness or during periods of low visibility at the latest possible time prior to the attack. When the defender has the capability to employ nuclear weapons, the attacker must avoid forming large vulnerable targets on either side of the river. Movements from

rear assembly areas are continuous through the crossing sites.

b. General support and reinforcing field artillery units must be prepared to provide close support for the assaulting troops during the displacement of direct support field artillery units to the far bank.

c. The major part of the field artillery crosses the river when it is determined that continuous effective support can be provided from the new positions.

d. Fire support planning must be detailed and coordinated at all echelons. The purpose of a river crossing is to move the attacking force across as rapidly and as efficiently as possible, so that it may either continue the attack to destroy the enemy or secure objectives which will protect the crossing of the remainder of the force. Field artillery with the crossing force is organized to support this essentially offensive operation and in accordance with the fundamentals for organizing field artillery for combat. Maximum feasible centralized control of field artillery is maintained consistent with the type of crossing made (deliberate or hasty) and with the intended employment of the assault forces when the crossing has been accomplished. When necessary, nuclear weapons or smoke may be used to insure a successful crossing. Properly employed, nuclear weapons or smoke may eliminate effective small-arms fire on the crossing sites; they may also eliminate effective fire on the crossing sites by destroying or neutralizing enemy artillery or enemy observation capabilities. Chemical fires that produce negligible contamination may be used at the crossing sites. Chemical fires that produce significant contamination may be used to isolate the defending forces or restrict their movement. Consideration should be given to maintaining a reserve of nuclear weapons for employment against the mobile counterattacking forces of the defender after the assault crossing. The use of air-transported troops to lend flexibility and speed to crossing operations requires close and detailed coordination of supporting fires.

e. When nuclear weapons are employed, initial objectives are normally deeper than when only nonnuclear weapons are employed. Initial objectives, which may include objectives for airmobile or airborne assault, are selected to isolate the defending forces, destroy them in place with nuclear weapons and offensive maneuver, or force them out of position. Rapid exploitation follows the assault across the river obstacle.

f. Prior to, during, or immediately after the crossing, field artillery may be required to—

(1) Furnish illumination either with searchlights or illumination shells.

(2) Provide smoke to interfere with or prevent enemy observation.

(3) Screen movement and crossing noises of the attacking force by fire.

(4) Support feints and demonstrations.

7–53. Field Artillery Support of a Defense at a River Line

a. The organization for defense depends on the terrain, the enemy situation, the forces available, and the nuclear and air situation. Field artillery is employed to cover all probable crossing sites. It is deployed in depth so that it can mass fires on critical points in the enemy's rear. Elements of the field artillery may be positioned on the far shore in support of security forces. Coordination between the field artillery and the security forces is essential to insure the withdrawal of the field artillery with the security forces. Emphasis is placed on fires which assist in canalizing the enemy and which stall his attack astride the river and destroy him by fire and counterattack. When the enemy's main crossing is disclosed, field artillery must be prepared to support the counterattack with the bulk of its fires. Emphasis is placed on maintenance and probable routes of displacement, and on preparation of fire plans and supplementary positions to support all counterattack plans.

b. When the number of suitable crossing sites available to the enemy is limited, the planning for nuclear and chemical fire support includes provisions for the disruption of the approaches to the crossing sites on either or both sides of the river, depending on the defense maneuver plan. A target analysis is made of the area within the defensive position for the possible elimination of enemy bridgeheads by use of nuclear and chemical fires. Nuclear and chemical fires against the enemy on the friendly side of the river are exploited by mobile reserves. Nuclear and chemical fires on the enemy side of the river are exploited with other fire support resources.

c. If the enemy has an airlift capability with which to overcome the river obstacle, defenses must be established commensurately.

Section IX. STABILITY OPERATIONS

7-54. General

a. Gaining the support of the population is of paramount importance in the formulation of national strategy in a stability operations environment. The military role must be viewed as part of the larger problem of internal development; therefore, military actions must not only provide tactical benefits but must also support long-range internal development objectives. This requires, for example, selective use of field artillery firepower to insure that the support of the population is not lost as a result of the tactical operations.

b. Field artillery is capable of supporting all aspects of internal defense and internal development activities. In stability operations, tactical operations are conducted to destroy insurgent forces and bases and establish a secure environment within which internal development is possible. Tactical operations are coordinated with civilian agencies through the area coordination center (ACC). The pressure of field artillery elements in some areas may discourage movement in open and restricted areas covered by detailed force planning. The degree of participation by field artillery is dependent on several factors, including United States policy, the host government policy, and the level of insurgent activity (para 7-56).

c. The mobility, disposition, and tactics of insurgent forces are such that targets are difficult to locate and engage. Ammunition expenditures may be greater with fewer confirmed or measurable results when compared with those in conventional warfare. Prearranged fires designed to impede enemy movement across defensive lines or areas, and night illumination missions for outpost and village defense have proved invaluable. The demoralizing effect of field artillery fire on insurgents often justifies its use even though there is little possibility of obtaining measurable results. Field artillery, with its quick-reaction times and capability of shifting fires over wide areas, is a responsive and effective means of countering insurgent actions. The delivery of timely and effective field artillery fire in response to insurgent activity often discourages further activity within known weapons ranges.

7-55. Coordination Measures

The terms defined below are applicable to stability operations and are used in coordinating surface fires.

a. Tactical Area of Responsibility. A tactical area of responsibility (TAOR) is a specific area on the ground for which responsibility is assigned to a single commander and within which a base camp is normally located. All fire and maneuver conducted within a TAOR must be coordinated with the commander to whom it is assigned. TAOR boundaries normally follow established political boundaries to facilitate coordination.

b. Fire Coordination Area (para 6-20).

c. Area Coordination Center. An area coordination center (ACC) is established as a combined civil and military headquarters at regional, provincial, district, and local levels. The center is responsible to the area commander—military or civilian—for planning, coordinating, and directing operaions within its respective areas of jurisdiction. United States and host country policy and agreements will determine command relationships between combined forces in the center. The center does not replace the TOC at division level and above, nor the FSCC at brigade level and below, or the normal governmental administrative organizations in the area of operations. Its mission is to provide integrated planning, coordination, and direction of all stability operations efforts to insure immediate, coordinated response to operational requirements.

d. Area of Operations. The area of operations is that portion of an area of conflict necessary for military operations, either offensive or defensive pursuant to an assigned mission, and for the administration incident to such military operations.

7-56. Phases of Insurgent Activity

The degree of participation by US Army field artillery units in stability operations is related to the level of insurgent activity. The following phases of insurgent activity describe the levels of intensity of insurgency.

a. Phase I. Phase I ranges from circumstances in which subversive activity is a potential threat —latent or incipient—to situations in which subversive incidents and activities occur with frequency in an organized pattern. It involves no major outbreak of violence or uncontrolled insurgent activity (JCS Pub 1). *Subversion* is the major activity, and generally there are no insurgent tactical forces coordinating field operations.

b. Phase II. Phase II is reached when the sub-

versive movement, having gained sufficient local or external support, initiates organized *guerrilla warfare* or related forms of violence against the established authority (JCS Pub 1). Important factors of this phase are that, in guerrilla warfare, combat operations are conducted in government-controlled territory by relatively small groups using tactics characterized by elusiveness, surprise, and brief violent action for the purpose of absorbing and diverting government resources and creating an atmosphere of confusion and uncertainty. Insurgent tactical forces begin guerilla warfare operations while subversion continues. The insurgent objectives in this phase are to extend political control, initiate organized guerilla warfare or related forms of violence, and prepare for war of movement.

c. Phase III. The situation moves from phase II to phase III when the insurgency becomes primarily a *war of movement* (mobile warfare) between organized forces of the insurgents and those of the established authority (JCS Pub 1). Organized insurgent forces are forces which are capable of developing combat power similar in magnitude to that of opposing armed forces elements. The war of movement is initiated while both guerilla warfare and subversion continue.

7–57. Types of Warfare Engaged in by Insurgents

The type of warfare engaged in by insurgents is classified according to tactics employed.

a. Guerilla Warfare. Guerrilla warfare is conducted predominantly by the militant arm of the insurgent in the advanced phases of insurgency. Forces conducting guerrilla operations may vary in size from squad to company, or larger. They may be organized as regular, paramilitary, or irregular armed forces. The distinction between these forces is based on differences in organization, training, weapons, equipment, and mission. The operations conducted by these forces are characterized by surprise, elusiveness, and brief, violent actions. This type of warfare may be supported in varying degrees by external support.

b. War of Movement. War of movement is conducted predominantly by sophisticated paramilitary or armed forces in phase III insurgency. War of movement comprises movement in which the opposing sides seek to seize and hold the *initiative* by use of maneuver, organization of fire, and terrain. Units are prepared to defend objectives deliberately for longer periods than in guerrilla warfare. They attack, in battalion or larger size forces, military units of similar size; however, there are no frontlines or rear areas, and the battlefield is not organized as in limited and general positional warfare. Positional warfare comprises those operations in which the opposing forces seek to seize and hold *terrain* permanently by use of maneuver and organization of fire and by retention of the initiative. Positional warfare normally is associated with limited and general war but may be conducted in the latter stages of an insurgency. In any case, be it a war of movement or positional warfare, the guerrilla threat may exist. If so, appropriate defensive measures must be planned by all units.

7–58. Employment of Field Artillery

a. General. Stability operations consist of activities in support of indigenous or allied forces engaged in establishing, regaining, or maintaining control of land areas threatened by guerrilla action, revolution, subversion, or other tactics aimed at internal seizure of power. Field artillery tactical missions in stability operations are the same as in unlimited or general war (chap 3). Additional missions that may be assigned field artillery units in stability operations include internal security operations (para 7–60), intelligence operations (para 7–61), military civic action (para 7–62), psychological operations (para 7–63), and advisory assistance (para 7–64).

b. Considerations. In stability operations, greater emphasis is placed on the employment of batteries and sections on independent missions with centralized control. Employment of battalion-size units will seldom be practical or possible because of the wide dispersion of internal defense assistance forces, difficult terrain, limited observation, and lack of, or limited, mobility. Some of the considerations are listed below.

(1) *Main considerations*

(*a*) Particular consideration must be given to general limitations on the use of field artillery and other fires in populated areas. Fire planning and coordination must insure that fires are highly selective and restrained in application in the vicinity of a population whose support of the government is of paramount importance, and whose physical well-being and property must be protected. The field artillery commander must establish liaison with the area coordination center (para 7–55*c*) in order to maintain close coordination with the representatives of air, naval, and host country fire support elements.

(*b*) Additional fire support may be needed because of the wide dispersal of batteries or sections and because poor terrain conditions may make observation of field artillery fire difficult.

(*c*) The positioning of field artillery is influenced by the requirment for defense against guerrilla attack and by the necessity to maximize the 6,400-mil firing capability.

(*d*) Additional security forces are normally required to maintain adequate and continuous security for the position.

(*e*) Field artillery is capable of delivering fire in all conditions of weather and terrain, both day and night. Fires can be massed and shifted rapidly and accurately over a large area without warning. This provides the field artillery the ability to conduct demonstrations for show of force, which provide a great psychological effect on the insurgents.

(*f*) Maintenance, supply, and other logistical activities may be difficult to maintain. Methods must be devised and instituted to provide logistical support when field artillery units are deployed or when the insurgents control surface transportation routes.

(2) *Special considerations.*

(*a*) Techniques for requesting and adjusting field artillery fire should be locally adapted and sufficiently flexible to allow indigenous personnel to request and adjust fire.

(*b*) Timely and accurate field artillery fires delivered on an insurgent force in stability operations may have a dual impact—one that is damaging to the insurgent force and one that is reassuring to the friendly force.

(*c*) Cannon batteries (platoons) (sections) may operate at remote distances from each other for short periods of time. In such instances, the battery (platoon) (section) must be augmented with the appropriate elements of survey, security, fire direction, and transport.

(*d*) Field artillery may be employed to provide fire support in border denial operations. Field artillery is especially effective when accurate fire is needed to deny entry into or exit from the area of operations. FM 31–16, FM 31–23, and FM 31–55 contain further information on border denial operations.

(*e*) Survey and reconnaissance parties must take extensive security precautions. Route and position reconnaissance will often be limited to aerial reconnaissance, maps, and/or survey data. Survey data, in the form of trig lists and bench marks, may be nonexistent or unusable. Use of the observed firing chart and, when time is available, the highburst registration may be normal.

(*f*) Field artillery units may be used to provide protection for convoys. See FM 31–16 and FM 31–23 for further information on convoy protection.

(*g*) Often weapons must be moved by air, water, packmule, and overland. Light units may be moved by helicopter to firing positions to support friendly operations. These units should prepare SOP and loading lists and should be trained in the tactics and techniques of airmobile operations.

(*h*) Field artillery may be employed to provide reconnaissance by fire. This is accomplished by firing on suspected targets or target areas in order to produce a reaction from the insurgent force.

(*i*) The vast areas normally associated with stability operations and the resulting extended distances between units or elements will complicate command, control, liaison, supervision of operations, training, administration, and maintenance. Maximum opportunity to exercise command, with its inherent responsibilities and pride of leadership, should be given to the small-unit commander.

c. Security. In addition to the security consideration listed in *b*(1)(*c*) above, field artillery in position or in convoy, ammunition trains, supply, and command and control activities are at all times vulnerable to insurgent attack or ambush. The mission of the field artillery unit is always the primary planning consideration; however, commanders should recognize the omnipresent threat of the insurgent forces. The threat imposes a need for constant vigilance and normally will necessitate a request for additional security forces from the force commander. It is axiomatic that the more fragmented a field artillery unit and its activities become, the more susceptible and vulnerable they become to insurgent action. Imagination and ingenuity, for instance, in the use of Army aircraft in a column cover role and coordination with friendly units along the route of march should be exploited.

d. Massing Fires. The most effective way to mass sufficient combat power rapidly when an elusive enemy is engaged in difficult terrain is through the use of fire. When the insurgent force has been located, the use of massive fire support is necessary to defeat the insurgent and destroy his position. Fleeting targets can be attacked by extensive fire planning of preplanned on-call fires to

neutralize, block, and canalize the target. Fire support should include field artillery, tactical air, attack helicopters and naval ships (C 2, para 99*b* and 59*a*, FM 31–16).

7–59. Tactical Operations

a. One of the primary differences between field artillery employment in limited and general war and in stability operations is the requirement in stability operations to limit casualties among the civilian populace, and limit damage to the materiel resources of the country. Consideration may be given to integration of riot control munitions into the unit's planning for fire support. Indiscriminate application of field artillery fires in populated areas may turn the populace away from the government and toward the insurgent movement. The support of the populace is the key to success.

b. Field artillery in position or being displaced, associated combat service support installations, survey and forward observer parties, and command and control facilities constantly are subject to insurgent attack. Field artillerymen must be prepared at all times to defend their positions. As many activities as possible should be collocated for security.

7–60. Internal Security Operations

a. In addition to supporting unit tactical operations in strike campaigns, field artillery must be prepared to assume territorial fire support responsibilities. This role is particularly pertinent in consolidated areas and areas undergoing consolidation. In such areas, the police will have assumed responsibility for the internal security of the hamlets and of certain consolidated areas between the hamlets. Small insurgent parties still may be operating in the area. Field artillery may assist the civilian police in enforcing a population control measure such as a curfew.

b. The territorial security requirement may require that, for long periods of time, field artillery be fragmented and employed down to section level. The requirement to cover an entire political area with fire from dispersed field artillery pieces must be balanced with the requirement to mass fires against insurgent formations. Field artillery employed in territorial security must cooperate and be able to communicate with host country police and local political functionaries in order to provide effective fire support to hamlets and along lines of communication.

c. Civilian police and paramilitary forces, together with field artillery troops, may be integral portions of a single, coordinated defense position in which the artillery unit is located. Field artillery troops and units must be able to participate in internal security operations in and around firing positions.

7–61. Intelligence Operations

a. Field artillery units in internal defense and development situations are more involved in producing intelligence than they are in limited and general war. This is particularly true of territorial security field artillery, which characteristically is scattered among many population centers within the supported political subdivision.

b. Field artillery units employed in territorial security are in proximity to both the civilian populace and the insurgent forces. No frontlines separate the field artillery from direct contact with the enemy, as in limited and general war; therefore, battery personnel are key information collection agents. Close contact with civilian police in conducting combined internal security operations enhances the scope and depth of intelligence available. Selected personnel from platoons and sections should be familiarized with intelligence activities to enable these units to exploit their information collection capabilities when deployed independently. Field artillery may be tasked to conduct reconnaissance by fire and to provide cover and deception.

c. Counterintelligence efforts must be emphasized to prevent sabotage and compromise of field artillery personnel, materiel, and information. This problem is particularly acute for small dispersed units. Counterintelligence support may be requested from supporting military intelligence organizations.

7–62. Military Civic Action

Field artillery units contain personnel with specialized skills developed through branch training and various types of specialized training which may be used profitably in military civic action; however, imagination must be given free play to cope with unusual situations. Programs that may use the versatile capabilities of field artillery units include, but are not limited to, those discussed in *a* through *d* below. For a more complete discussion of the nature of military civic action and requisites for successful programs, see FM 31–23 and FM 41–10.

a. The communications facility organic to US units may be used to augment the existing communications system or to provide a temporary communications system for civil use in remote areas. Field artillery units can furnish wiremen, switchboard operators, and telephone operators with necessary equipment and installation and repair capabilities to augment civilian facilities, particularly within the perimeters of consolidated areas. Technicians are available who are capable of installing, operating, repairing, and supervising radio and radio teletypewriter communications media.

b. The unit survey crew, with additional training, can assist military civic action projects by surveying for unsophisticated roadways, bridges, building sites, airstrips, and other installations.

c. Transportation available in field artillery units can be used to assist the local government and the civilian populace. Although the number of mechanics within a field artillery unit is limited, some instruction and supervision can be offered to host country personnel.

d. Administrative assistance can be provided to the local government from organic sources, although this capability is limited.

7-63. Psychological Operations

a. General. Psychological operations are a command responsibility. They include all actions designed to influence the attitudes and behavior of hostile, neutral, or friendly groups in such a way as to support the achievement of national objectives. Psychological operations media include loudspeakers, radio, television, printed matter, movies, and face-to-face communication. For details on propaganda media, see FM 33-5.

b. Field Artillery Units. Field artillery may be used to provide a psychological impact in addition to the actual damage caused by fire. When directed, US Army field artillery units may participate in planned psychological operations and demonstrations. For example, firing demonstrations show how quickly and accurately on-call artillery can respond to calls for fire. Also, field artillery projectiles and aircraft may be used to disseminate psychological or operations leaflets and other printed media. Field artillery permits accurate distribution of this material regardless of the weather conditions. Other tasks that may be performed by field artillery include—

(1) Instructing individual soldiers on the importance of maintaining good relationships with the civilian population to increase the information of intelligence value provided by civilians.

(2) Reporting actions and conditions which may be exploited. These may include indications of low morale of the hostile force and actions by friendly forces that improve the living conditions of the civilian population.

c. PSYOP Units. Personnel from PSYOP units may assist units in planning and providing propaganda support such as leaflets, loudspeaker and audiovisual teams, and target information. In addition, PSYOP units coordinate with US Air Force and US Army aviation facilities for aerial dissemination of printed material and for aerial loudspeaker broadcasts. For a complete discussion of psychological operations, see FM 33-1 and FM 33-5.

7-64. Advisory Assistance

a. In the initial phase of any insurgency, US Army field artillery personnel may be organized into mobile training teams (MTT) to train host country field artillery units. Normal tasks performed by the MTT may include—

(1) Providing instruction in maintenance and operation of equipment, assistance in establishing logistical and services systems, and recommending civic actions and community relations programs.

(2) Providing assistance and advice in organizing and equipping units and in preparing plans and training programs.

b. Assistance from US Army field artillery units may include advice on military organization, training, operation, doctrine, and materiel, thereby contributing to the effectiveness of the host country forces.

c. Personnel assigned as advisers to host country artillery units must understand field artillery capabilities in general and specific techniques that are peculiar to the use of field artillery in stability operations. Areas requiring special attention in stability operations are weapon characteristics, ammunition, mobility, calls for fire, patrol support, harassing and interdiction fires, selection and preparation of positions, coordination of fires, and care and maintenance of equipment.

(1) *Mobility.* In addition to the normal field artillery prime movers, other means of transport may be used. The adviser must use imagination and ingenuity when normal prime movers are unavailable or when their use is impracticable.

(*a*) *Boats.* Operations conducted in large inundated areas or in areas bisected by navigable streams and rivers can be supported by field artillery through the use of boats as prime movers. The landing craft vehicle, personnel (LCVP) can transport weapons up to and including the 105mm howitzer. The howitzer should be loaded muzzle first in order to facilitate unloading. In most cases, the crew will be able to manhandle the weapon into and out of the boat, using the handbrakes for control. If it is necessary to beach the craft on a steep bank, the weapon may have to be extracted by means of a block and tackle or winch.

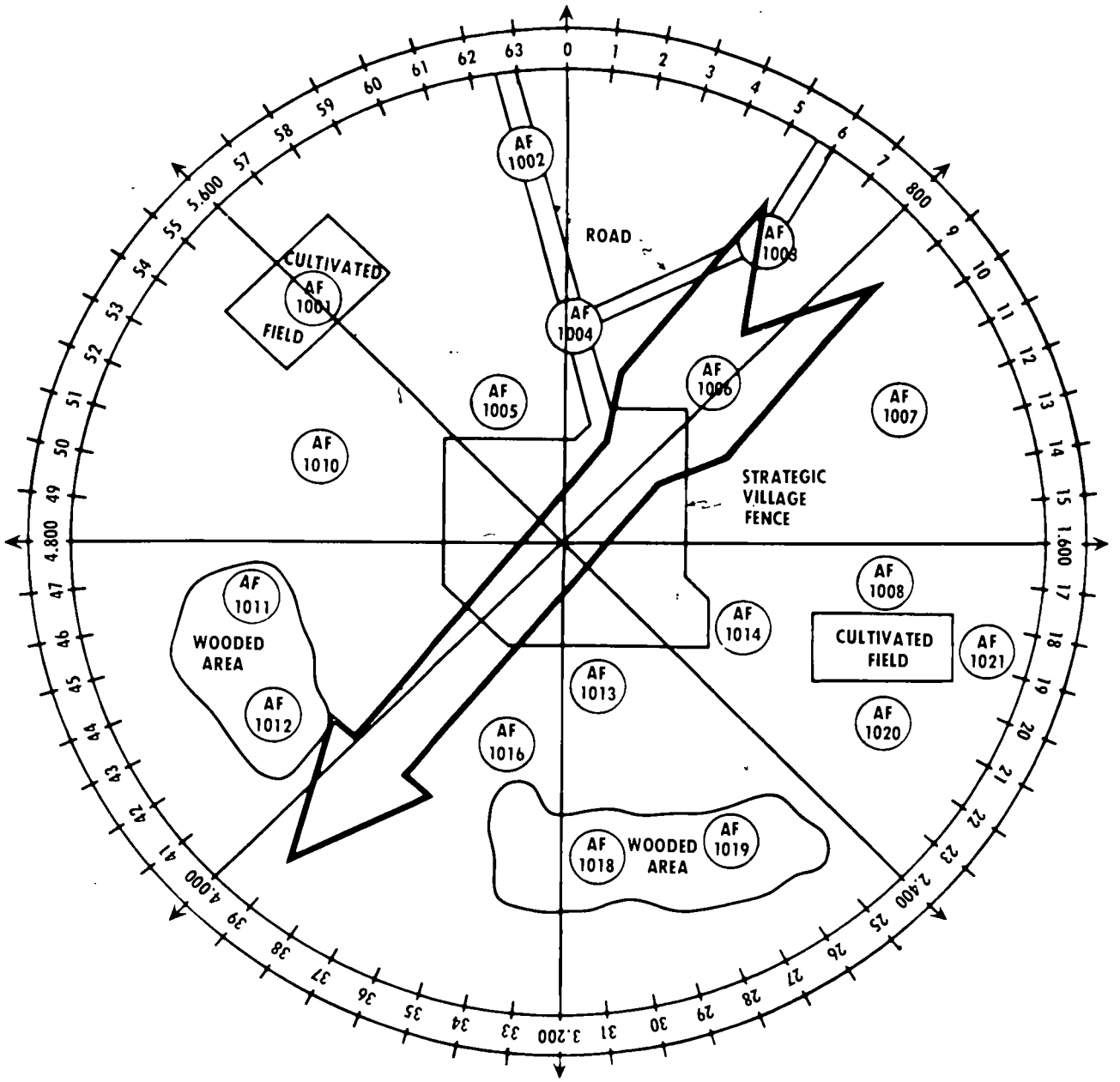
(*b*) *Helicopters.* Towed weapons up to and including the 155mm howitzer can be lifted by helicopter. Helicopter transport permits the use of field artillery in almost any operation where terrain and the enemy situation are deterrents to normal ground mobility. Depending on the type of helicopter used, it may be necessary to disassemble the howitzer into several loads. Whenever possible, reconnaissance for positions should be conducted. Ammunition resupply should have priority when helicopters are used for field artillery transport.

(*c*) *Armored personnel carriers.* In marshy, inundated areas, the personnel carrier affords an excellent means of positioning field artillery.

(2) *Calls for fire.* A simple method by which defenders can call for field artillery fire should be devised. The method must be easily understood by villagers, and the call for fire must be easy to transmit over the local friendly communications system. An example of an aid that can be used to assist relatively untrained paramilitary personnel in calling for field artillery fire in the event their post or hamlet is attacked by guerrilla forces is a round board divided into quadrants, with each quadrant painted a different color. The first quadrant may be red; the second quadrant, white; the third quadrant, blue; and the fourth quadrant, yellow. The board is permanently mounted in the village and is oriented on north-south line. Defenders can call for fire by using a color to indicate direction. This method requires close coordination with field artillery units and as many preplanned targets as possible. Another example is the target indicator (fig 7–1). The target indicator is located permanently where there is good observation and is oriented by grid azimuth. On it are depicted preplanned targets and prominent terrain features. When under attack, the defenders position the movable arrow in the direction(s) of attack and call for fire, using either a polar or the preplanned target nearest the enemy force. The amount of detail depicted on the target indicator can vary, but too much detail should be avoided to minimize confusion. The distances to terrain features can be shown to enable the defenders to give a more accurate polar plot. A member of the supporting field artillery unit should orient the target indicator in the post or hamlet and instruct defenders on its use. As many potentially capable individuals as possible should be trained in its use. Check rounds should be fired periodically on the planned targets, especially those in close proximity to the post or hamlet, to insure accurate fire in the event of attack. More sophisticated methods can be devised, depending on the time allowed for training and the receptiveness of trainees to instruction. Any method requires reliable and responsive communications. The techniques of using a small plotting board (M10 or M17) at the observation post may be considered. This technique can easily become an all-weather observed fire (OF) fan, terrain sketch, and visibility diagram all in one.

(3) *Patrol support.* Active patrolling in an area where stability operations are being conducted is mandatory. Whenever possible, field artillery support of patrols should be provided. The support must be carefully coordinated before the patrol begins. The supported commander must provide the field artillery unit such information as the size of the patrol, the times of departure and return, the mission of the patrol, the routes to be used, and any special instructions. Patrols should report locations in accordance with a time schedule or when they have moved a significant distance. Prearranged fires may be planned on critical areas. As a minimum, the patrol route should be indexed to match prominent or easily identifiable terrain features from which the patrol leader may reference calls for fire.

(4) *Harassing and interdiction fires.* Field artillery fire, because of its psychological effect on insurgents, should be employed to the maximum in the harassing and interdiction (H&I) role. Targets for H&I fires can be obtained from many sources to include maps of insurgent-controlled areas, informers, and patrol reports. Infantry commanders and district leaders should stress the importance of having patrols locate and record suspected insurgent routes and installations. Patrols should be ordered to record coordinates of deserted camps, villages, or areas which appear to be insurgent training areas. Such locations should be fired on from time to time in order to curb



NOTE: DEPENDING ON THE SIZE OF THE INDICATOR, THE ARROW MAY BE GRADUATED FOR DISTANCE SO THAT USER SCALE DISTANCES TO TARGETS.

Figure 7-1. Example of type target indicator.

insurgent movement, to deny insurgents use of the areas, and to lower insurgent morale. Targets for H&I fires must be carefully selected in order to insure the safety of local inhabitants.

(5) *Selection and preparation of positions.*

(*a*) To the maximum extent possible, field artillery positions should be selected to afford a 6,400-mil firing capability. Care should be taken not to mask field artillery fires when the positions are in or near built-up areas. Although position security is a primary consideration, the ability to perform the mission is the paramount consideration.

(*b*) Improvement of the position area is continuous. However, improvement should not result in a cannon parapet which precludes the ability to conduct direct fire.

(*c*) Alternate position areas should be selected throughout the friendly locale to add flexibility to the employment of field artillery. In order to deny the insurgents advance knowledge of the locations of alternate position areas and the

opportunity to mine or make plans for ambush, the areas should not be prepared. Field artillery should move intermittently to within range of areas in which insurgents feel secure (out of normal field artillery range) to keep the insurgents off balance and disrupt their activities.

(6) *Coordination and control of fire.*

(*a*) Coordination between the supported force and the supporting field artillery is vital. Field artillery may be attached to or in direct support of the supported force. As a minimum—

1. Communications are established.

2. Call signs are arranged.

3. Weapon capabilities are explained to the supported force commander.

4. Forward observers and liaison (fire support) officers are assigned.

5. Fire planning is accomplished.

(*b*) Control of fire is the inherent responsibility of the force commander, who delegates authority to coordinate fire support to the field artillery commander (FSCOORD). The field artillery commander (FSCOORD) has knowledge of the scheme of maneuver and the disposition of friendly forces and, by virtue of close liaison with the force commander, is able to render quick decisions on calls for fire. Calls for fire must be answered as quickly as possible. Restrictions imposed by force commanders that unduly delay delivery of field artillery fire should be examined and explained to host country counterparts immediately upon discovery in an effort to have such restrictions removed. Firing demonstrations may be conducted to prove the worth of field artillery to, and build confidence in, the host country counterparts.

d. When advising a host country counterpart in the planning of an operation that includes field artillery, the adviser must insure that the unit assigned the mission is able to accomplish the specific inherent fire support responsibilities of that mission. See chapter 3 for the responsibilities inherent in the standard field artillery missions.

Section X. AIRMOBILE FIELD ARTILLERY OPERATIONS

7–65. General

a. Airmobile field artillery is artillery that is transported by aircraft in a tactical configuration to accomplish the field artillery mission without using the aerial prime mover as a firing platform. Field artillery must possess mobility equal to or greater than that of the supported force. Airmobile cannon units support elements of the force by providing surface-to-surface fires. Aerial field artillery units support elements of the force by providing air-to-surface fires. These units also provide an additional capability of delivering supporting fires on targets or objectives outside the range of ground-emplaced units.

b. This section provides guidance for commanders and staff officers in planning and executing their movement of field artillery with helicopters. Application of the guidance can be altered when fixed-wing aircraft are used. See FM 57–1 and TM 55–450–15 for details of air movement of troops and equipment.

7–66. Concepts of Employment

a. Field artillery movements in which aircraft are used as the primary means of transport are conducted as tactical moves and may be executed during daylight or darkness. Air movement of field artillery has application in all types of operations and is used to rapidly launch units into battle in support of the maneuver force, to overcome natural and manmade obstacles that would otherwise prevent occupation of position, to facilitate rapid displacement of units over terrain inaccessible to wheeled and tracked vehicles, to bypass enemy troop concentrations, and to position units to facilitate future operations. However, in consolidation operations, airmobile field artillery may remain in positions which may be resupplied by helicopter for relatively long periods of time.

b. Air movement of field artillery is characterized by detailed planning and coordination, aggressive execution, speed of displacement, and operation with minimum personnel and equipment for periods of short duration.

c. Air movement of field artillery is conducted in four phases—planning, loading, movement, and occupation of position. The planning phase consists of coordination with supported and supporting units, fire planning, reconnaissance and selection of positions, preparation and issuance of orders, and rehearsals, when the situation permits. The loading phase consists of ground movement to appropriate pickup areas as required; preparation of the helicopter loading areas within the position area; preparation of troops, equipment, and sup-

plies for airmobile operations; and loading of helicopters preparatory to actual movement. The movement phase consists of the actual move from the loading area to the landing site. This phase commences with takeoff of the first helicopter and ceases with arrival of the last helicopter load at the landing site. The occupation of position phase includes the organization of the helicopter landing site by an advance element, unloading of personnel and equipment, and occupation of the position.

d. A field artillery battalion in an airmobile operation may be assigned the standard tactical mission of direct support (DS), reinforcing (reinf), general support (GS), or general support-reinforcing (GSR). Modified or nonstandard tactical missions may also be appropriate. See chapter 3 for a detailed description of these missions.

e. A field artillery battalion is normally placed in direct support of a brigade task force and is employed to cover the entire area of operations of the supported brigade. The depth of the objective and the mission of the supported force are major factors in the determination of the amount, type, and positioning of field artillery to support the operation.

f. The direct support field artillery battalion commander or his representative (the fire support officer) is the fire support coordinator (FSCOORD) for the brigade, and is located where he can best coordinate all fire support means available to the brigade task force and insure that fires are planned and delivered in accordance with the plans and needs of the force.

(1) The command post of the direct support field artillery battalion may be collocated with the brigade command post or with one of the howitzer batteries supporting the force.

(2) A minimum of one airmobile howitzer battery is positioned to provide support throughout the zone of a committed combat battalion. Mutual support between field artillery batteries is desirable. Batteries may be required to operate independently for a short period of time to support small task forces in an airmobile operation. It may be necessary to augment such batteries with personnel and equipment.

(3) Field artillery units must be flexible and capable of moving with extremely short leadtimes in various types of aircraft. Units must establish standing operating procedures (SOP) and conduct training in these procedures.

g. Attack helicopters may be assigned the mission of providing security to transport helicopters in airmobile operations and of delivering fires in the landing zone (LZ) just prior to the arrival of the force. Attack helicopters also provide a means of supplementing and extending the fire support capability of the ground commander.

h. Further details concerning field artillery employment in airmobile operations are given in FM 57–35 and FM 6–102.

7–67. Planning

a. General. The success of an air movement of field artillery depends largely on planning. The length and detail of the planning phase depend on the urgency of the situation. Planning is materially enhanced by the development and rehearsal of the SOP and by frequent briefings. Briefings should include information on present and future operations, current sortie requirements, data on weather and terrain, and a review of possible landing zones in the area of operations. The planning phase of the movement begins immediately upon receipt of the warning order and continues through commencement of the movement. In addition to the concept of operations, major considerations involved in planning the movement are command and control; coordination; organization of the unit consistent with the mission; reconnaissance and selection of ground and air routes, loading areas, landing sites, and position area(s); preparation of helicopter loading and unloading plans; resupply requirements; and preparation and issuance of the unit operation order. Specific instructions and deviations from the SOP are provided for by fragmentary orders and prearranged messages.

b. Command and Control. The relationship between the aviation commander and the field artillery commander is determined by the mission/status (direct support, general support, or attachment) assigned to the aviation unit. If the aviation unit is attached to or placed under the operational control of the field artillery, a command relationship is established and control is transferred to the receiving commander or headquarters. If the aviation unit is assigned a mission of direct support, or general support, a coordination relationship is established and control is retained by the parent unit. If the field artillery is allocated helicopters on a mission basis by sorties, the relationship is one of coordination only. A command relationship insures responsiveness to the field artillery's needs. However, because of the demand for airlift throughout the field army and the

inherent advantages of centralized control of Army aircraft, aviation elements will normally be provided to the artillery on a mission basis by sorties, and the relationship between the field artillery and aviation unit will be one of coordination. Further details concerning command and control are found in FM 57–35.

c. Coordination. Coordination relative to the field artillery air movement should be conducted on a continuing and aggressive basis throughout all phases of the operation. Normally, a liaison team or a representative, to include a pathfinder from the supporting aviation unit, is provided to the field artillery unit to assist in the technical aspects of planning and executing an air movement and to supervise rehearsals, preparation, and distribution of equipment in the loading area(s), loading and unloading, and signaling relative to the air movement. Continuous liaison must be maintained between the field artillery unit and the aviation liaison team or aviation representative in all phases of the movement to include agreement on sortie requirements, radio frequencies, flight routes, armed helicopter escort requirements, desired landing zone characteristics, load configurations, and distribution of equipment for movement.

(1) The unit to be airlifted is responsible for rigging its loads for movement, to include providing all slings, ropes, and nets. The aircraft crewchief/loadmaster inspects the load for airworthiness. He is responsible for airworthiness, securing internal loads in the helicopter, and providing the necessary means to do so. Cargo straps are organic to the lift company and are carried aboard the aircraft. See the 55–1100-series technical manuals for detailed rigging guidelines.

(2) Specific areas of responsibility of the supported and supporting units must be specified and made known to all concerned.

d. Organization for Movement. Organization of the field artillery unit for air movement is an integral part of the planning phase and depends on the type of extraction employed and the type of aircraft available.

(1) The airmobile field artillery unit normally displaces in three echelons during air movement. These echelons are designated the assault echelon (air); the resupply, or followup, echelon (air and/or surface); and the rear echelon (surface).

(*a*) Composition of the assault echelon of a unit varies with the assigned mission, aircraft available, and duration of the operation. The assault echelon consists of battery elements that are essential to the control and/or the delivery of immediate fire support from the objective area.

(*b*) The resupply, or followup, echelon consists of the combat support personnel, supplies, and equipment necessary to sustain the assault echelon until linkup or extraction occurs. These necessities are transported to the assault echelon by air and/or surface means.

(*c*) The rear echelon consists of the rest of the force, which remains in a rear area until termination of the operation or accompanies the ground linkup force. The rear echelon may be charged with the responsibility of insuring that resupply of the assault echelon is accomplished.

(2) In both categories of extraction—extraction to assault and extraction from contact—firing elements in the pickup zone retain the capability of processing fire missions as long as possible.

(3) The success or failure of an operation may depend on the adequacy of each echelon of the airmobile field artillery unit. Therefore, emphasis should be placed on the selection of troops and equipment for each echelon, and responsibilities should be assigned to the most essential personnel consistent with requirements imposed by the assigned missions.

(4) The use of pathfinders should be oriented to their primary mission of providing navigational assistance to Army aircraft. Other capabilities of pathfinders should be exploited only if they do not detract from the pathfinder's primary mission (FM 57–38).

e. Reconnaissance.

(1) In airmobile operations, a physical reconnaissance of field artillery position areas should be conducted, if possible, during the planning phase. However, physical reconnaissance frequently may be prohibited due to the unavailability of aircraft, the speed of operation, or a requirement to maintain surprise and security. The commander must be prepared to move his unit with only limited information available. Physical reconnaissance by air, when feasible, is conducted in accordance with established principles. The reconnaissance provides needed information on the new position area to include alternate landing zones, terrain, routes of communication, enemy situation, location of friendly troops, and flight routes. It may be necessary for the field artillery commander to conduct reconnaissance during the assault with elements of the supported force.

(2) The positions selected must permit the unit to accomplish its mission. The versatility of airmobile techniques makes possible the emplacement of field artillery in positions previously considered inaccessible. Weapons can be placed on top of a ridge, among tree stumps, along riverbanks, or in other positions where there is room for the howitzers and sufficient clearance for helicopter rotor blades. An additional landing area is required for cargo helicopters transporting internal loads. Battery formations are often dictated by the terrain. Individual piece corrections may be necessary to obtain the desired effect in the target area. Other factors affecting the selection of positions are weather and the tactical situation. Desirable characteristics of an airmobile howitzer battery position are—

(*a*) Dry, well-drained ground. An area within or adjacent to the battery position that can accommodate cargo helicopters, when required.

(*b*) Terrain suitable for defense and located within the infantry perimeter (when such location will not interfere with the mission of either unit).

(*c*) All-round (6,400-mil) firing capability.

(*d*) Maximum defilade consistent with the accomplishment of the assigned mission.

(*e*) Proximity to natural obstacles.

(3) The following factors should be considered in selecting helicopter landing zones within or adjacent to field artillery positions from maps, air photographs, and physical reconnaissance:

(*a*) *Size of the landing zone.* Specific dimensions of the area required for landing and maneuvering helicopters vary with the size of the helicopter, the lift formation, the altitude of the area, and the tactical situation.

(*b*) *Surface conditions.* Surface conditions should be such that the landing area is not obscured by excessive dust when the helicopter begins to hover, and such that the helicopter does not bog down upon landing. Loose debris that may cause damage to the engine or rotor blades should be removed.

(*c*) *Navigational aids.* Rely on the pathfinders for navigational aids. If they are not available and the landing zone is not easily identifiable from the air, navigational aids, such as pane's, strode lights, smoke grenades, radios, and radars, should be available to vector aircraft to the desired locations.

f. General Considerations.

(1) In an airmobile operation, the primary means of tactical communication is FM radio. Wire communication is normally restricted to installations within the landing zone and to base camps in rear areas. A radio/wire integration (RWI) station may be established as a link to higher headquarters. Reliable communications are essential to the precise timing and execution of airmobile operations.

(2) Pathfinder elements and equipment organic to specific aviation units may be used to aid in the terminal guidance and control of helicopters supporting the field artillery movement. TOE pathfinders are trained and equipped to establish and operate electronic and visual navigational aids to assist the helicopter crews in locating a designated facility within a landing area; furnish ground-to-air voice radio communication to the helicopters for the purpose of providing information, guidance, and control; reconnoiter for and recommend suitable drop or landing zones; and assist in the assembly of airlanded forces. When TOE pathfinders are not present, terminal guidance must be accomplished by field artillery personnel of the moving unit, who use equipment which is available or improvised. A departure airfield control officer (DAFCO) operates in the pickup zone (PZ), and a landing zone aircraft control officer (LACO) operates in the landing zone. These field artillery personnel organize their respective areas and maintain contact with the supporting helicopters.

(3) Positioning of loads according to a standard plan reduces the number of air-to-ground transmissions and personnel briefings and the amount of coordination. Loads should be positioned to reduce flight over the battery as much as possible. All equipment should be positioned so that the aircraft can approach into the wind. Wind direction takes precedence over battery overflight.

(4) The DAFCO and LACO, when providing instructions and information to helicopter pilots in flight, should be in a position where they can observe the aircraft, the loads, or the ground markers.

(5) Marking devices available to the field artillery unit are air-ground recognition panels and vests and smoke grenades. An easily identifiable point of reference (e.g., a T-marker) should be established as a reference point to vector the aircraft to a specific point in the pickup or landing zone.

(6) Helicopters may be directed to specific loads or locations by radio transmissions. This method, however, is slow and requires many transmissions. A color-code system may be em-

ployed instead. Each load, including howitzers, is assigned a color, which is conspicuously displayed on the load. The guide in the landing zone wears an air-ground recognition vest or uses an air-ground recognition panel of the same color as that assigned the load. The pilot is told thecolor of his load prior to reaching the pick up zone. En route, he notifies the LACO of his load color and proceeds directly to the marked site or to the appropriate guide, who guides him to the position.

(7) Helicopters can be guided to their pickup or release points by a guide on the ground or by the crew chief in the helicopter. The results are the same; only the manner in which the pilot is informed differs. The method to be used should be selected before the move starts.

(*a*) A ground guide instructs the pilot by hand-and-arm signals. During daylight operations, he wears a colored vest; at night he uses colored lights or illuminated batons. The reference point used to guide the helicopter is the load or marker.

(*b*) The crew chief observes the load or the panel marker through the helicopter hook hatch and directs the pilot to the pickup or release point by means of the helicopter intercom. During daylight operations, a panel marker or color-coded load may be used as a load or drop point marking device. At night, colored landing lights are used to mark the load or drop point.

7–68. Loading

Loading may commence during the planning phase and continue through the movement phase. It includes preparation of the pickup zone and the control of incoming aircraft. With no prior preparation, initial loading should begin at least 2 hours prior to the arrival of the first aircraft. The battery should retain its fire capability as long as possible under the existing conditions.

a. Preparation of the Pickup Zone. Preparation of the pickup zone includes rigging loads, positioning marking devices, and positioning equipment for rapid pickup. Loads are inspected for completeness and compactness.

(1) A colored marking device is used to guide the helicopter to the location of the specific load for pickup.

(2) The howitzer is positioned with the tube into the wind. Its accompanying ammunition is so placed as to take advantage of local terrain and obstructions and to facilitate use of the smoothest path to liftoff as well as liftoff itself. Sliding rigging under the weapons trails and placing the bag to the rear is the best positioning because it minimizes helicopter roll and pitch on liftoff. Additional ammunition is packed and placed in a central location.

(3) Sling loads may be placed anywhere the helicopter can hover for hookup. Tents within 50 to 75 meters of the landing site or along the approach path should be lowered and secured.

b. Control of Aircraft.

(1) Prior coordination with the aviation liaison officer will have established the number of helicopters supporting the displacement. Assistance in controlling the helicopters may be obtained from pathfinder elements organic to specific aviation units. In order for the pathfinders to render assistance, close coordination must exist between the DAFCO and the pathfinders.

(2) In the absence of pathfinders, the DAFCO controls the incoming aircraft in the pickup zone. He furnishes the flight with information concerning the enemy situation, wind direction and velocity, surface conditions, and landing direction and clearance. He may furnish the landing site azimuth, field elevation, landing formation, and other information as required.

7–69. Movement

a. Final coordination and briefings are completed prior to liftoff of the advance party helicopter. If the field artillery commander is in the forward area, the executive officer briefs the flight leader. The flight leader must know the location of the landing zone, the radio frequency used for the move, the location of field artillery firing along the flight route, the call sign of the control party in the landing zone, the order of march, and the number of sorties.

b. The interval between arrival and departure of helicopters will depend on the plan of maneuver, the conditions in the landing zone, and the number of helicopters the landing zone will accommodate. The advance party helicopter for a battery may be followed in as short a time as 5 minutes by the remainder of the battery, or the battery may await the battery commander's order to move forward.

c. Correct timing is essential in order to keep helicopter orbit and ground times to a minimum.

d. During the approach to the landing zone, passengers should orient themselves by observing the landing zone through ports in the helicopters. Mounting and dismounting from the helicopters

should be as rapid as possible to reduce helicopter ground time.

7–70. Occupation of Position

a. During the planning phase for a battery operation, the battery commander tentatively selects locations of key installations, plans the organization of the prospective landing zone, and coordinates procedures for control of aircraft during the occupation.

b. Prior to departing the pickup zone, the battery commander briefs the advance party on the new landing zone, the order of march, and the howitzer formation to be used.

c. Immediately after the advance party arrives in the landing zone, the battery commander or his representative designates battery center and confirms the howitzer information to be used. The location of the T-marker depends on established SOP. A guide from each howitzer section clears his immediate position area of any loose debris and obstacles and prepares the position to receive the equipment. Each guide displays a marking device of the same color as that assigned to his section.

d. If pathfinders or other aviation personnel are not on the ground or at the landing site, the battery commander or his representative, as the LACO, gives the pilot the color to guide on and the normal landing information as discussed in paragraph 7–68.

e. Ammunition should be placed close to the howitzers during occupation.

f. Once the battery is on the ground, standard firing battery and fire direction procedures outlined in FM 6–40 are followed.

g. The only elements necessary for positioning aircraft on return trips are approach instructions, field artillery firing information, and a guide.

Section XI. AIRBORNE OPERATIONS

7–71. General

a. Airborne operations involve the movement by air of combat forces and their logistical support forces into an objective area for the execution of tactical or strategic missions. These forces may consist of airborne divisions, airmobile divisions, infantry divisions, mechanized infantry divisions, air-transportable army missile commands, and other air-transportable units with supporting field artillery. Airborne operations may be joint operations in which Air Force and/or US Navy aircraft are used, or unilateral operations in which Army transport aircraft are used.

b. Light and medium field artillery normally accompanies the assault echelon in an airborne assault or the initial echelon in an airlanded operation. The airborne division artillery is trained and has the capability to enter combat entirely by parachute assault. The airborne division light field artillery, the infantry division light and medium field artillery, and nondivisional light and medium field artillery are air transportable in medium transport aircraft and medium assault aircraft. Heavy cannon and short and medium range missiles with launchers are air transportable in heavy transport aircraft. Very heavy cannon artillery and medium-range missile units may be transported in the largest transport aircraft. Field artillery may support airborne operations from outside the objective area by providing long-range nuclear or nonnuclear fires.

c. For further information on airborne operations, see FM 57–1 and TM 55–450–15.

7–72. Plans and Estimates

a. Preliminary plans and estimates for airborne operations normally originate at theater level with the tentative selection of missions for airborne units. Upon dissemination of the complete planning directive, concurrent and continuous planning is undertaken at all echelons of the affected units. Techniques and procedures for airborne planning are contained in chapter 10, FM 61–100. The commander and staff at each level of command should be included in the planning sessions of the next higher headquarters. Field artillery representatives (fire support coordinators) should be included as members of the supported unit's planning group. This practice expedites concurrent planning at all echelons through personal coordination between successive headquarters. During the early phases, plans must be developed from estimates that may be based on assumptions and fragmentary information. Therefore, all plans are subject to change as more complete and reliable information becomes available to the subordinate units.

b. Factors to be considered in planning for the employment of field artillery in an airborne operation are as follows:

(1) The requirement for mass preassault nuclear and/or nonnuclear bombardment of enemy forces and installations in the objective area.

(2) The requirement for other preassault nuclear and/or nonnuclear fires.

(3) The capability of field artillery to rig material for heavy-drop parachute delivery from aircraft or helicopters.

(4) The need for refresher training in air transportation techniques.

(5) The requirement for rigid security to deny the enemy knowledge of the planned operation and to preclude his use of nuclear fires against the departure area prior to the launching of the operation.

(6) The possibility of creating obstacles or excessive contamination in the objective area when nuclear fires are to be employed in the area prior to landing.

(7) The impracticability of conducting ground reconnaissance of position areas in the objective area and the need to determine accurate declination constants, survey data, and target intelligence from outside agencies.

(8) The requirement for communication between the field artillery headquarters in the airhead and the field artillery headquarters of link-up or supporting forces.

(9) The requirement for early establishment of centralized control of field artillery in the assault phase.

(10) The need for a fire coordination line between airborne assault and link-up forces to prevent fires or the effects of fires of one force from interfering with the operation of the other force.

7-73. Training

a. An analysis of the mission of the airborne force and the elements of intelligence concerning the drop area and objective will indicate the type of training that must be stressed. Special attention will be given to training in loading aircraft (TM 55-450-15). The types of aircraft that are to be allocated to each unit should be determined as early as possible. If the units are unfamiliar with the types of aircraft included in the allocations, additional training in loading will be necessary to insure efficient operation. Training will include complete rehearsals. Practice landing areas should resemble the actual landing areas as closely as possible.

b. Although it is desirable to drop or airland the field artillery in areas already secured by the infantry, changing situations may force field artillery units to defend themselves in the drop or landing zone or to fight their way to designated assembly or position areas. These probabilities require that field artillery units be trained in infantry tactics to include fire and maneuver and use of individual weapons.

7-74. Communications

In airborne operations, radio is the principal means of ground-to-ground and air-to-ground communication. Visual signals and panel codes supplement radio and furnish quick and reliable communication, particularly between air and ground elements. Short wire lines, laid quickly by hand, facilitate fire direction. Light aircraft may lay wire for longer distances when feasible. The communication plan must provide for expansion from decentralized to centralized control and for communication with other supporting arms and services. The correct use of appropriate communications-electronic operations instructions (CEOI) will reduce or eliminate much of the communication difficulties and confusion characteristic of early action in the area of operations.

7-75. Security

Surprise is a requisite of successful airborne operations. The amount of information that can be divulged to the troops and the time of its release are regulated at all echelons of command. Usually, only a few key personnel are briefed prior to being restricted to the marshaling area. However, every man is briefed on the operation as soon as security permits.

Section XII. COLD WEATHER OPERATIONS

7-76. General

Field artillery units operating in northern areas are faced with two main problems—mobility and survival. Movement (para 7-79) is a greater problem during the warmer months than during the colder months. The season of the year, equipment, and training affect the survival problem. Shelter and heat are major requirements for

troops operating in snow and extreme cold. Concentrations of troop shelters make profitable nuclear targets. The use of nuclear weapons may produce an unusually large number of casualties because of direct effects of the explosion, secondary fires, and subsequent exposure to extreme cold. In areas where the ground is frozen and no snow cover exists, personnel are particularly vulnerable to nuclear attack.

7–77. Plans and Preparation

Personnel and equipment must be made available well in advance of operations in a northern area so that training can be conducted under conditions similar to those anticipated in the area. Troops must be in peak physical condition and trained in their primary duty prior to entering areas of deep snow and extreme cold. Training should include instruction in survival, operations in subzero weather, sanitation, personal hygiene, and care of equipment in extreme cold. Special equipment must be used, and the equipment must be winterized and equipped with modification kits prior to arrival in extremely cold areas.

7–78. Survey

Survey in snow and extreme cold is slow and tedious. Lenses quickly become fogged. Computation of data is expedited when temporary shelter is provided. Control points are difficult to locate and will normally be found only along well-established roads and railroads. Because of deep snow, crevices, and other obstacles natural to arctic terrain, it is often simpler and faster to run a survey by following existing roads and trails, even though the cross-country distance is considerably shorter. The use of electronic equipment, such as distance measuring equipment (DME), makes survey more feasible.

7–79. Movement

In northern areas, movement is affected by the varying types of terrain. Large areas are covered with coarse vegetation and boggy muskeg. Roads are scarce, and the heavy snow and the swamps restrict movement of wheeled vehicles. The best time of the year for cross-country movement of heavy vehicles is during the latter part of the freeze-up period and the first part of the winter period prior to the arrival of heavy snow. The use of oversnow vehicles increases the mobility of the supply and reconnaissance echelons of the field artillery unit. Self-propelled weapons are more maneuverable than towed weapons; however, the present self-propelled weapons are too heavy to traverse deep snow in winter or muskeg in summer. In the summer, movement on waterways, such as lakes and rivers, is often possible. Extensive use should be made of helicopters in moving field artillery.

7–80. Positions

a. Supply difficulties greatly influence the selection of position areas. Positions are chosen for their tactical utility and for protection from the elements. Prior to occupation of a position, the terrain should be carefully reconnoitered; and weapon positions, traffic lanes, and snow parapets should be prepared. When the situation permits, direct support field artillery should be located adjacent to or within the perimeter of infantry elements. During the winter period, it is impossible to dig in a position, but parapets of snow and ice can be erected. In extreme cold, some type of heated shelter will be required for personnel whose duties must be performed in the open.

b. Camouflage discipline must be strictly enforced. Limited camouflage can be obtained by application of paint. Tracks left in snow cannot be effectively covered except by fresh snowfall. Therefore, vehicles and troops must move only on designated trails and roads.

7–81. Observations

a. During the winter months, good observation is limited to a few hours each day because of the short periods of daylight. Snow cover reduces depth perception and obscures ground features and landmarks. Glare of the sun upon the snow is intense; and unless personnel are wearing dark glasses, continued exposure will cause painful snow blindness. Observing instruments must be equipped with amber filters to reduce eyestrain. Personnel operating observing instruments must be relieved frequently or provided with shelter. Forward observer teams should be trained in the use of oversnow equipment and in rock-climbing techniques.

b. Extensive use of aerial observation is required. Army aircraft are invaluable for reconnaissance, location of targets, and adjustment of fire.

c. Standard countermortar radars and surveillance radars, like other electronic equipment, are sensitive to extremely low temperatures. When temperatures are low, heat must be applied to the

console before it will operate. A heated shelter is required for plotting personnel.

d. Sound recorders are not affected by low temperatures. Microphones will function satisfactorily at low temperatures and under 4 to 6 inches of dry snow. The time required to establish a sound base in arctic regions is normally four to five times that required under normal conditions.

7–82. Field Artillery Fires

a. At times, especially during extremely cold periods and periods when temperature changes are sudden, the ballistic characteristics of weapons and ammunition are affected. During extremely cold periods, a K factor of 100 meters or more per 1,000 meters of range is not uncommon. Fuze quick is ineffective in deep snow, as up to 80 percent of the fragmentation is absorbed by the snow cover; however, such fires may often be used effectively to initiate avalanches in enemy areas. An airburst with either a variable time (VT) or mechanical time fuze is most effective against personnel in the open. Although VT fuzes are adversely affected by extreme cold and there is an increase in the number of malfunctions, the VT fuze is one of the most effective fuzes for the arctic. Information concerning the effects of nuclear weapons in snow is contained in the 101–31 series field manuals; the 3–10 series field manuals contain information concerning chemical weapons effects.

b. Deep snow may have an adverse effect on chemical agents; however, when the snow melts and is churned up, the chemical agent may pose a threat once again. Smoke and riot control canisters from a base-ejection shell may be smothered in the snow. The phosphorous shell will produce the desired smoke, but the phosphorous particles buried in the snow may be a hazard until the snow disappears.

c. During extreme cold, the rate of fire will be slow until the weapons have warmed; this is especially true of weapons that have a hydropneumatic-type recoil. Preparation of ammunition is slow when temperatures are low because of the reduced efficiency of personnel.

d. Under conditions of extreme cold, heating blankets or other means of heating may be necessary to protect missile motors that use solid propellants.

7–83. Communications

a. Radio is a rapid and useful means of communication in northern areas. However, dry and wet cell batteries are seriously affected by extreme cold, both in storage and in operation. The efficiency and life of batteries decrease in direct ratio to the temperature.

b. Wire lines are normally restricted to existing trails and roads and are vulnerable to all existing hazards. Poles are broken by storms or uprooted by frost heaves. Wire laying by light aircraft is economical. This method should be employed when practicable. It is usually less time consuming to lay new lines than to attempt to repair old ones. Wire must be stored in a warm place up to the time of laying.

7–84. Maintenance

Maintenance is critical in northern operations. Careful monitoring of the use of vehicles and equipment, regular maintenance, and the use of arctic lubricants are necessary. Care must be taken in the disassembly of howitzers to prevent parts from freezing. If parts freeze, they cannot be reassembled. Ammunition, particularly proximity fuzes, must be stored carefully.

Section XIII. RIVERINE OPERATIONS

7–85. Definitions

a. Riverine Area (Environment). A riverine area is an inland area with an extensive network of rivers, canals, streams, irrigation ditches, paddies, and/or swamps extending over broad, level terrain, parts of which may be inundated periodically or permanently. It may preclude sparsely populated swamps or forests, places where rivers and streams have steep banks densely covered with tropical trees or bamboo, and locations where the terrain is relatively flat and open. A large agrarian population may be concentrated along the waterways. Riverine areas near the ocean are affected by the tides.

b. Riverine Operations. Riverine operations include all military activities designed to achieve and/or maintain control of a riverine area by destroying hostile forces and restricting or eliminating hostile activities. Operations are characterized by the extensive use of water transport to move

military forces and equipment. Friendly ground forces may operate with Navy river forces, Air Force support units, or host country forces.

7–86. General

a. Environmental and tactical situations vary greatly in riverine operations. The environment varies with the tides and seasons. The variations in environment complicate operations conducted in an area with many differences in terrain.

b. Limited mobility in the riverine environment restricts certain aspects of combat support. Although support requirements are no more severe than normal, immediate response is essential. Units may be widely dispersed and, due to environmental restrictions, may not be mutually supporting. The lack of dry land, which many units need to accomplish their missions, may require the force commander to establish priorities for the use of suitable and available land by unit/agency to facilitate planning and prevent confusion.

c. The nature of riverine operations creates several environmental factors which challenge the ways and means of providing field artillery support. These factors include inadequate survey control, poor maps, insufficient dry land for field artillery position areas, lack of valid meteorological data, and curtailed ability to mass fires when fire direction is necessarily decentralized.

d. Normal field artillery tactics do not change. However, the techniques of employing field artillery may change to fit the situation and terrain. Field artillery operations in riverine areas may differ from those in other land warfare areas.

(1) Field artillery may have to be pre-positioned in hostile areas before the attack begins. Movement of the field artillery and occupation of position will be conducted as an infantry-type operation with air/naval support and other field artillery support. Additional forces for the security of the prepositioned field artillery may be required.

(2) As in other ground operations, field artillery is organized for combat in accordance with the requirements of the operation. However, lack of adequate position areas and the requirement for use of water transport may limit the quantity and caliber of weapons to be employed.

(3) Position areas may be small and in insecure locations.

(4) Batteries must be prepared to use all available means of transportation during an operation.

(5) Absence of positions in defilade, lack of cover and concealment, and positioning in insecure areas necessitate use of direct fire techniques and antipersonnel ammunition.

(6) Field artillery may not be able to deliver accurate fires without adjustment due to a lack of survey control and valid meteorological data.

e. A complete discussion of riverine operations is presented in FM 31–75.

7–87. Movement

a. Movement of the field artillery in the riverine environment is accomplished primarily through the use of watercraft and helicopters. Current manuals adequately describe procedures for land and air movement.

b. The force commander allocates boats/barges for use by field artillery.

c. The battery/battalion commander and the transporting unit commander must coordinate their plans and movements with the forces providing air or field artillery support and security.

d. Battery commanders/executive officers and boat commanders must insure that the course is independently and continuously plotted and must verify their positions with each other. This procedure insures accuracy of location if and when emergency occupation of position is necessary.

e. Air and field artillery support, an air observer, and a radio relay capability are required for all field artillery movements.

f. Buoy markers should be placed on howitzers and prime movers to facilitate recovery if equipment sinks.

g. The naval element, using the Monitor (a reinforced gunboat) and assault support patrol boats (ASPB), furnishes boat security for the floating prime movers. Armed helicopters, tactical air, supporting field artillery, and host country forces may provide additional support and route security on request.

h. A system of checkpoints is necessary to facilitate locating the water column during the move. Naval radar systems and Decca navigation equipment on board escort watercraft can be used by the field artillery commander to provide position locations.

i. Current tidal information must be considered in conducting waterborne movements.

7–88. Positions

a. The fundamentals of positioning cannon battalions and batteries specified in chapter 4, FM 6–140, apply to riverine operations.

b. When supporting an operation, batteries should be located in the combat area when possible.

c. When the field artillery is not waterborne during the rainy season, positions must be selected along canal and river banks and existing roads to the extent possible.

d. Desirable qualities of firing positions for barge- or boat-mounted field artillery are:

(1) Steep banks below the surface of the water to minimize listing as the tide causes the water to fluctuate.

(2) Wide streams to the front or rear to reduce the danger of hand grenades and small-arms fire, and to allow the use of antipersonnel ammunition.

(3) Limited avenues of approach over land.

(4) Areas that minimize anchorage problems. Areas of strong currents should be avoided when possible.

e. During some operations, it may be necessary to erect firing platforms on which to emplace weapons in swampy terrain (para 7–91*b*(2)).

7–89. Observation

a. Air observation in the riverine environment, particularly during all waterborne movements, is essential due to the lack of commanding terrain.

b. Coordination between air observers and forward observers on the ground insures the best field artillery coverage, coordination, and surveillance of the battle area.

c. Techniques and procedures for all types of observation (part III, FM 6–40, and chapter 8, FM 6–140) apply to riverine operations.

d. Field artillery observers must be able to adjust naval gunfire. Coordination of frequencies and circuits for obtaining naval gunfire is necessary before each operation. Current field artillery procedures are used to adjust river assault squadron fire.

7–90. Fire Support Coordination

a. Fire Direction.

(1) Fire direction and fire planning in riverine operations follow conventional methods. Fire direction should be centralized at battalion when possible. However, widely dispersed operations and special task assignments may dictate fire control and fire direction under battery control.

(2) If afloat, battery and battalion fire direction centers are generally semipermanently installed on separate landing craft (LCM–8).

b. Coordination.

(1) Current doctrine prescribing techniques and procedures for planning and coordinating fire support (chap 6 and 10) is valid for riverine operations. Additional coordination and planning may be required before and during operations, because the forces of two or more services and/or nations may be involved.

(2) The company commander coordinates his own fire support and integrates available fire support with his scheme of maneuver or plan of defense. The company commander may have fire support from the battalion heavy mortar platoon, field artillery, tactical air force, armed helicopter support, naval gunfire support, and the direct and indirect fires of Navy river assault squadron (RAS) boats.

(3) At battalion, the FSCC is located at the maneuver battalion command post or aboard a command and communication boat (CCB).

(4) At brigade, the FSCC is located at the brigade command post, aboard the brigade self-propelled barracks ship (APB), at the land base, or, when further forward, aboard a command and communications boat.

7–91. Field Artillery Employment

a. Self-Propelled. When the self-propelled 155mm howitzer M109 is employed from the LCM–8, it may be fired while the LCM–8 is underway or anchored to the bank. However, structural damage may develop to the LCM–8. Employment of the M109 howitzer from the LCM–8 is the same as that of barge-mounted field artillery (*b*(1) below). The M109 howitzer has a 6,400-mil capability when employed from the LCM–8, and affords armor protection for the crew. Use of the M109/LCM–8 combination eliminates the need for additional boat space for prime movers.

b. Towed.

(1) *Barge.* Towed 105mm howitzers can be mounted on 90- by 30-foot field artillery barges or pontoon causeway sections (6 ft by 6 ft). One LCM–8 landing craft is used as the prime mover for each barge. The barge is positioned against the bank so that the howitzer can be laid in the normal manner. Aiming post, with extensions, or

collimators are placed on the banks to provide aiming references. The FDC for barge-mounted batteries is located in the well deck of the LCM–8 used to transport one of the barges. Wire communication from the FDC to the executive officer's post on the center barge or on the river bank is used for transmitting fire commands. Wire communication is also used between the executive officer's post and the guns.

(2) *Field artillery firing platform M6.* The airmobile firing platform is used in the riverine environment to provide a "land firing base" for light field artillery platform, is generally constructed of aluminum, and is designed for use with the 105mm howitzer M102. The platform can be employed in up to 6 feet of water or mud, and can support a howitzer and crew and approximately 110 rounds of ammunition. However, the employment of an additional platform per weapon provides the much needed space for sand-bagged culvert shelters for protection of the crew. The platform is emplaced by a medium- or heavy-lift helicopter.

7–92. Survey

a. The absence of survey control in the riverine area necessitates the use of observed firing charts.

b. Support of water movements and patrols requires emphasis on the preplotting of targets and the establishment of control points from which firing data can be transferred.

c. If survey control points (SCP) are available and a unit is in an area of operations for a sufficient length of time, the distance-measuring equipment (DME) organic to the division artillery is used. The flat riverine terrain facilitates use of this equipment. Survey parties, augmented with security forces and using boats or helicopters, can establish survey control points.

7–93. Ammunition

The size of the ammunition loads of howitzer sections depends on the mode of transportation used. Field artillery barges are capable of carrying from 1,200 to 1,500 rounds in their integral ammunition storage areas. The size of the ammunition loads carried by landing craft and boats depends on the draft and cargo capacity of the craft and the number of craft available. The amount of ammunition delivered by helicopters will be limited to the allowable cargo load.

CHAPTER 8

FIELD ARTILLERY OPERATIONS

Section I. SUPPORT OF THE OFFENSE

8–1. General

Field artillery in support of the five types of offensive operations must be organized and deployed to provide the most responsive and most appropriate fire support to the attacking elements, furnish continuous support during the action, and protect the attacking force during consolidation and reorganization. The weight of field artillery firepower and priority of fires is normally given to the main attack. During a reconnaissance in force and during the frontal attack in a coordinated attack, exploitation, or pursuit, control of fire support is normally centralized with FA elements to facilitate adding combat power to the maneuver units as required. During a movement to contact and during the penetration or envelopment in a coordinated attack, exploitation, or pursuit, control may be decentralized, priority of fire established, or FA units attached to the forward or main attack forces.

8–2. Actions Before the Attack

Actions which must be accomplished by field artillery prior to the attack include—

a. Development of an organization for combat and preparation of a plan of fire support.

b. Reconnaissance, selection, and occupation of firing positions.

c. Establishment of communications with the supported unit.

d. Provision of common survey control for firing units and target acquisition installations.

e. Organization and coordination of observation.

f. Establishment of liaison and coordination of fire support.

8–3. Field Artillery Positions in the Offense

a. General. Responsibility for the selection of field artillery positions is indicated by the tactical mission assigned the artillery force (chap 3). Positions should be carefully selected to insure that continuous and effective fire support is provided to the maneuver force throughout the offensive operation.

b. Position Areas. In the offense, the selection of position areas is normally based on the following considerations:

(1) Field artillery is placed as far forward as practical to exploit the range of the weapons and to facilitate liaison and communications.

(2) Position areas are selected in the zone or area of responsibility of the supported unit to avoid interference with other units.

(3) Positions should facilitate organization and future operations.

c. Alternate and Supplementary Positions. All field artillery commanders are responsible for the selection of necessary alternate and supplementary positions. These positions are not as critical in the offense as in the defense, but should be prepared to the extent possible.

8–4. Offensive Fires

a. Fire Planning. Fire planning is continuous. A thorough knowledge of fire planning is necessary to obtain maximum effects from available field artillery means. See chapter 10 for a detailed discussion of field artillery fire planning. An effective plan for the use of field artillery fires must—

(1) Provide for adequate support for the scheme of maneuver of the supported force.

(2) Provide for the use of weapons according to their capabilities for target defeat.

(3) Provide for massed fires throughout the zone of action of the supported force.

(4) Facilitate future operations.

b. Fires Before the Preparation. Fires before the preparation usually consist of registrations, fires on targets of opportunity, and fires covering the deployment and movement of the attacking

troops into position. Harassing and interdiction (H&I) fires may be employed to restrict enemy operations, disrupt communications, and prevent the movement of enemy reserves.

c. Registration.

(1) Registration increases the accuracy of field artillery fires, permits placing unobserved fires close to friendly troops, and saves ammunition. However, unrestricted registration discloses field artillery positions and thereby indicates strength and deployment, signifies the commander's intentions, and invites neutralization. These disadvantages can be minimized by—

(*a*) Using special registration positions.

(*b*) Limiting the number of batteries to register.

(*c*) Registering as late as possible before the attack.

(*d*) Registering several units simultaneously.

(*e*) Employing meteorology plus velocity error (Met plus VE) techniques to reduce the need for registration.

(*f*) Using common survey control and current meteorological data.

(2) The field artillery commander recommends to the supported unit commander whether registration will be restricted, prohibited, or unlimited. When conditions indicate a need to restrict registration, the field artillery commander coordinates registration.

d. Preparation. The field artillery commander recommends to the supported unit commander whether a preparation will be fired and, if so, its duration. The time length of the preparation may vary from a few minutes to several hours, depending on the degree of surprise required, the amount of ammunition available, and the number of confirmed (*known*) or suspect (*possible*) targets. The preparation may be divided into phases. In general, any division of a preparation into phases should provide for gaining fire superiority over hostile field artillery in the early phases, neutralization of hostile field artillery throughout the preparation; disruption of command and communications systems; and delivery of massed fires on enemy forward elements just prior to the assault. These phases allow the field artillery to attack, in succession, various types of targets according to priority.

e. Fires During the Attack. Fires during the attack are delivered to assist the advance of the supported unit. Successive attacks on confirmed or suspect enemy locations may be prearranged. Fires must be planned beyond the final objective, including fires on likely avenues of approach, to protect the attacking unit during its reorganization.

f. Meeting Engagements.

(1) Field artillery in support of a movement to contact, or a reconnaissance in force, must be adequately dispersed in the formation to support any action in any direction. Normally FA elements are most dense in the forward area of the formation. When the advance guard, flank, or rear guards deploy, supporting field artillery occupies positions at once to support them.

(2) Field artillery support is not limited to planned fires. The timely delivery of fire is given first consideration. The field artillery moving to positions should be given road priority.

(3) Heavier caliber weapons are dispersed throughout the advance guard and main body columns to provide supporting fires when required.

g. Exploitation and Pursuit. Field artillery in support of an exploitation or pursuit normally is attached. Field artillery attached to an exploiting or pursuing force must have a high degree of mobility due to the fluidity of these types of operations.

h. Reconnaissance in Force. Field artillery is one of the principal sources of combat power in the support of a reconnaissance in force. Although the primary aim of this tactic is reconnaissance, it may disclose weaknesses in the enemy disposition which, if promptly exploited, will permit tactical success. Reconnaissance in force may be part of either defensive or offensive operations. For details, see FM 100–5 and FM 61–100.

Section II. SUPPORT OF THE DEFENSE

8–5. General

Field artillery must be prepared to support all types of defensive operations and all phases of the defensive action. It must be capable of massing fires on critical localities beyond the range of the weapons organic to the supported maneuver unit. The field artillery must be prepared to fire in any area by rapidly shifting its direction of fire or by firing in several directions simultaneously from a single firing position. It augments the defensive fires of the supported force with final protective fires and other prearranged fires.

8–6. Field Artillery Positions in the Defense

a. General. The rapid availability and concentration of field artillery fire is essential to a successful defense; therefore, centralized control is desired. Every effort is made to meet the enemy main attack with a mass of field artillery fires. Deception is employed to mislead the enemy as to the amount of field artillery and its locations. Position areas are selected to provide continuous and effective field artillery fire support throughout the action. Organization of position, target acquisition, survey, communication, and fire planning are as complete as time and the situation permit.

b. Position Areas. In the defense, the selection of position areas for the field artillery normally includes the following considerations:

(1) Field artillery is echeloned in depth to insure that continuous field artillery fire support can be provided within the battle area.

(2) All division artillery is positioned so that it can fire immediately in front of the forward edge of the battle area (FEBA).

(3) Some field artillery units may be placed in forward supplementary positions to provide counterbattery and longer range harassing and interdiction fires and to deceive the enemy as to the true location of the primary locations.

(4) The advantage of defensive terrain features and access to a route of withdrawal are considered.

(5) Priority of positions is given to units providing direct support for the elements in contact.

(6) Whenever possible, position areas are selected in the zone or area of responsibility of the supported unit to avoid interference with other units.

(7) Positions should facilitate organization and future operations. All units prepare their positions for defense against ground and air attack. Camouflage is stressed.

(8) Firing units may displace often to preclude being pinpointed as a target. The displacement should be so conducted as not to disclose a pattern.

c. Alternate and Supplementary Positions. All field artillery commanders are responsible for the selection of necessary alternate and supplementary positions and for insuring that the positions are prepared to the extent possible. Alternate positions are usually occupied only when the primary positions become untenable. Supplementary positions are usually occupied only after approval by the commander of the supported force or higher field artillery echelon.

8–7. Defensive Fires

a. Fire Planning. Detailed fire planning is essential to effective field artillery support of defensive operations. See chapter 10 for a detailed discussion of field artillery fire planning. Defensive fires are planned to—

(1) Delay and disorganize the enemy's approach.

(2) Disrupt the enemy's attack preparations by use of counterpreparation fire.

(3) Impede the enemy's attack by use of the close defensive fires in width and depth throughout the sector.

(4) Break up the enemy's assault by use of final protective fires.

(5) Limit penetrations by use of on-call fires.

(6) Support the counterattack and associated limited offensive actions.

b. Fires Delivered Before the Enemy Forms for the Attack. Fires delivered before the enemy forms for the attack include harassing and interdiction (H&I) fires which will force the enemy into early deployment, and fires in support of security forces (covering and general outpost forces).

(1) H&I fires are usually planned by division, corps, and army artilleries. Planning is based on studies of maps, terrain, road nets available to the enemy, enemy organization and tactics, and all other target intelligence. Targets suitable for harassing fires are enemy batteries, assembly areas, observation posts, communication centers, command posts, and leading elements. Targets suitable for interdiction fires are harbors, road junctions, bridges, and crossroads. Harassing and interdiction fires are irregularly timed to prevent the enemy from determining their pattern.

(2) Fires in support of a security force are usually planned by the highest field artillery echelon with that force. Included are all fires planned to cover the withdrawal of the security force. These fires often include fires from the field artillery with the main force.

(3) Field artillery supporting a general outpost force will usually fire from supplementary positions to avoid disclosing the positions prepared for use in support of the battle area.

(4) The time of opening fire is decided by the force commander. Premature firing, which may expose field artillery to neutralization and reveal

the plans of the defending force, is avoided. Firing is usually confined to the attack of targets presenting the greatest danger to the defending force.

c. Counterpreparation.

(1) Counterpreparation fire is intensive prearranged fire delivered just prior to the initiation of the enemy attack. It is designed to break up enemy formations; disorganize the enemy's systems of command, communication, and observation; decrease the effectiveness of his field artillery preparation; and shatter his offensive spirit. A counterpreparation is delivered in a scheduled sequence and is fired only on order of the force commander.

(2) Premature firing must be avoided, since it provides the enemy with counterfire data for his artillery preparation and indicates to him the areas to be avoided in forming for the attack. The timely delivery of counterpreparation fire is critical, particularly when the enemy attacking force is strong in artillery.

d. Fires Delivered During the Enemy Attack. If the enemy is successful in launching his attack, fires are delivered to break up his attack and limit his penetration. Included in these fires are final protective fires (FPF) of the field artillery and mortars.

e. Fires Delivered in Support of a Counterattack. If previous fires fail to break up or stop the enemy attack, field artillery fires are delivered in support of the counterattack to blunt the nose of the penetration, to destroy the enemy forces within the penetrated area, and to seal off the base of the penetration to prevent reinforcements.

Section III. RETROGRADE OPERATIONS

8-8. General

Retrograde operations are classified as delaying actions, withdrawals, and retirements. Field artillery units supporting retrograde operations should be highly mobile. Field artillery fires are employed to deceive, disrupt, or destroy the enemy, or delay his advance; to neutralize enemy artillery; to assist the maneuver elements in disengagement; and to support limited counterattacks and tank sweeps. Details of the maneuver aspects of retrograde operations are given in FM 61-100.

8-9. Field Artillery Employment in Retrograde Operations

a. General. A force engaged in a retrograde operation usually is weaker than the enemy. Therefore, the skillful and aggressive use of field artillery firepower is critical to the successful accomplishment of the force mission. Field artillery units are organized for combat to provide maximum flexibility and versatility of employment. Centralized control is retained to the maximum degree feasible. The assignment of tactical missions must provide for effective support to the committed maneuver elements, and retention at the force field artillery level of the capability to shift fires and units rapidly to meet unforeseen tactical contingencies.

b. Planning and Execution. Detailed planning for the employment of field artillery is conducted at force field artillery level. Execution is decentralized to the field artillery commanders at lower echelons to insure responsiveness to the field artillery support requirements of the maneuver elements of the force.

c. Positions. Initially, field artillery is positioned well forward to exploit the range of its weapons. Positions to the rear are selected and occupied as required to provide continuous field artillery fire support during retrograde operations.

8-10. Fire Planning

Field artillery fire support requirements are met through centralized planning and decentralized execution. Fires are planned on enemy avenues of approach, assembly areas, and troop concentrations, and on and behind the friendly position to support disengagement and withdrawal. The priority targets are enemy forward elements, fire support means, and local reserves. Fires may include all types of ammunition. Planned fire support is closely integrated with plans for the employment of the maneuver elements of the command.

8-11. Delaying Action

Field artillery supports a delaying action by delivering long-range fires from positions well forward to inflict damage and to delay the advancing enemy. Field artillery is echeloned in depth to

permit maximum continuous support as the enemy closes on the maneuver elements and forces them to yield ground. Field artillery battalions usually displace by echelon (leap frog) to insure that some fire units are always in position to respond to calls for fire. Ground and air observation to the front and flanks is maintained to permit surveillance of fires and adjustment of fire on targets of opportunity, and to provide continuous information concerning friendly and enemy activity.

8–12. Withdrawal (Not under enemy pressure)

Field artillery supports the withdrawal (not under enemy pressure) by providing continuous fires to the detachments left in contact. Field artillery units of representative calibers, in strength proportionate to the strength of the detachments left in contact, remain in position to cover the withdrawal. The remainder of the field artillery displaces with the main body to new positions to the rear. Close liaison and coordination are effected with the security detachments to insure the adequacy and timeliness of field artillery fires and to coordinate displacement of the field artillery remaining. The normal pattern of fires is maintained, if practical, to enhance deception and to cover the noise of displacing vehicles. Detailed fire plans are prepared to deceive the enemy and to counter, delay, disorganize, and disrupt his attempts to interfere with the withdrawal operation.

8–13. Withdrawal (Under enemy pressure)

a. Field artillery supports the withdrawal (under enemy pressure) by delivering fires to assist in disengagement and to delay, disorganize, and disrupt the enemy advance. Field artillery units displace to the rear by echelon, in close coordination with the movement of the supported force. For purposes of deception, representation of all types of field artillery with the force is maintained when appropriate. Timing is critical. General support field artillery is employed to provide additional fire support. Massed fires are delivered against enemy forces threatening the success of the withdrawal. When the situation warrants, control of displacements is delegated to lower echelon commanders to facilitate timing and coordination with the disengaging elements. Multiple routes of withdrawal are used, whenever possible, to speed the withdrawal and to avoid excessive concentration of troops and vehicles.

b. If enemy pressure prevents a friendly element from disengaging, a limited counterattack or tank sweep may be launched to relieve the pressure. Field artillery supports the counterattack with all available fires, including smoke, if needed, to screen friendly movements. Detailed coordination of fires with maneuver is essential.

8–14. Retirement

Strong field artillery support is provided to the security forces during a retirement. Field artillery is positioned throughout the retirement columns to support the main body or to furnish additional support to the security forces.

8–15. Withdrawal Through a Rearward Position

Retrograde operations frequently terminate in a withdrawal through a rearward position. Additional information is presented by paragraph 5–15.

Section IV. COUNTERBATTERY OPERATIONS

8–16. General

The term "counterbattery" includes fires on mortars, cannon, rockets, and missiles. Counterbattery intelligence has the objective of gathering complete information pertaining to hostile firing means. In this respect, counterbattery intelligence is more specialized than other phases of military intelligence. Its immediate operational objective is attained when the fire support agencies are provided with sufficient information to properly engage hostile weapons with effective fires. For a complete discussion of counterbattery activities, see FM 6–121 and FM 6–40.

8–17. Responsibility

a. General. Responsibility for counterbattery operations is not assigned any one field artillery echelon but is based on the premise that the most appropriate means available will be employed to locate and attack enemy weapons.

b. Staff Assistance. In discharging his counterbattery responsibility, a field artillery commander is assisted by—

(1) The S2/intelligence officer who is concerned with all intelligence.

(2) An assistant S2 (counterbattery officer)

who produces counterbattery intelligence, to include the location and identification of hostile weapons, the study of enemy tactics and techniques, and the determination of enemy capabilities and limitations.

(3) The S3, who uses organic, attached, and reinforcing weapons for the most effective attack of hostile weapons located by the S2 and his assistants.

c. All sources of intelligence, field artillery target acquisition means, and the sound ranging, flash ranging counterbattery radar platoons of the field artillery target acquisition battalion are used to determine the location of counterbattery targets. Coordination of counterbattery activities with elements of the field artillery target acquisition battalion located in the area will assist in the development of the counterbattery program.

8-18. Tactics

a. General. In many situations, the field artillery commander responsible for counterbattery operations must specify the counterbattery tactics to be employed. The tactics represent the commander's concept of employment of field artillery in the counterbattery role. The tactics specified by the commander must be continuously reviewed and revised in accordance with the changing situation.

b. Definition. Counterbattery tactics constitute the field artilery commander's plan for employing the field artillery to attack hostile weapons in support of the force commander's mission and plan of maneuver or scheme of defense. The plan may include the type of counterbattery program to be executed, the standard methods of attacking specific targets, and the artillery commander's guidance for establishing confirmed and suspect weapons locations for a specific tactical situation.

c. Description of Counterbattery Tactics. The three conditions which describe the counterbattery tactics that can be employed are listed below:

(1) Active status—The delivery of fire on all hostile weapons as soon as their locations are confirmed.

(2) Silent status—The withholding of fire in order to provide time for the collection of counterbattery target information by all available means so that a more effective counterbattery program can be prepared and to avoid disclosure of the force artillery strength.

(3) Semiactive status—A compromise between the active and the silent status. For example, a semiactive status may direct a silent status except for the delivery of fire on hostile weapons whose fires are causing damage to friendly elements. Some field artillery units may be required to follow an active status while others follow a silent status in order to avoid disclosing the number or types of artillery units in the force.

d. Considerations Affecting the Determination of Counterbattery Tactics. In determining the counterbattery tactics to be employed in a specific situation, the field artillery commander considers—

(1) The mission of the supported force.

(2) The tactics and techniques of employment of enemy artillery.

(3) The number and types of weapons in the enemy force and the degree to which they are active.

(4) The enemy's capability to reinforce his weapons.

(5) Our ability to locate enemy weapons.

(6) Our ability to deliver effective fire on enemy weapons by appropriate means.

(7) The strength, status, and morale of enemy artillery units.

(8) The intensity or type of fire required to achieve the desired effect on the enemy weapons.

(9) The enemy's capability to locate our fire support means and to deliver effective fire on our positions.

(10) The enemy's capability to locate and eliminate our counterbattery and countermortar radars.

(11) Our capability to employ deception techniques to reduce the enemy's capability to locate our fire support means.

(12) The communications employed by enemy artillery and the location of enemy communications installations.

(13) The electronic countermeasures (ECM) available to jam radio communications systems employed by enemy artillery.

(14) The ammunition available to support the counterbattery tactics.

(15) The use of special weapons by enemy or allied forces.

8-19. Execution of Fires

a. Hostile batteries should be attacked with surprise fire. Once neutralized, the batteries should be destroyed by fire—time and ammunition permitting. The accuracy of the fires can often be determined by sound, flash, or radar.

b. Because mortars are capable of displacing rapidly and frequently, an active hostile mortar normally should be engaged as soon as its location has been confirmed and adequately described to insure delivery of effective counterfires.

8–20. Evaluation of Fires

During the course of operations and after enemy territory has been overrun, the effect of counterbattery fires on hostile weapons should be evaluated. This evaluation will facilitate future counterbattery operations by revealing the—

a. Average number of weapons in a unit.

b. Use of alternate positions.

c. Typical location and organization of weapon positions.

d. Accuracy and effectiveness of counterbattery fires.

e. Efficiency of the counterbattery intelligence system.

8–21. Communications

Since speed is essential to counterbattery action, the organization for operation must include an efficient means of secure communication for the flow of information and for calling on the most suitable weapons for fire. In most instances, the normal communication systems will suffice. In some instances, additional facilities may be necessary for the rapid transmission of information. Field artillery communication channels are normally used for counterbattery activities. For additional information on communications, see FM 6–10.

Section V. FIELD ARTILLERY IN NUCLEAR ENGAGEMENTS

8–22. General

a. Progress in the development of nuclear weapons and their associated delivery systems has made powerful weapons available to combat commanders from field army down to brigade level. Future changes or continued technological progress may make them available at even lower levels. Consequently, commanders and staffs at all levels must have an understanding of nuclear weapons and their effects in order to employ them effectively.

b. When the use of nuclear weapons is imminent, field artillery must be capable of redeploying as soon as practicable. Limited maneuver only may be possible during the initial nuclear exchange. Therefore, the considerations of field artillery dispositions during conventional war must be such that the field artillery will be able to accomplish its mission with minimum displacement if called upon to render nuclear support.

c. The battle for nuclear superiority will be won through the combined effort of all US forces. This section discusses the role of the field artillery in this combined effort and to certain considerations in the employment of nuclear weapons.

8–23. Role of Field Artillery in Nuclear Engagements

a. Nuclear Superiority. The principal field artillery task in nuclear combat is to gain fire superiority as rapidly as possible over the enemy's nuclear artillery throughout the area of influence of the supported force commander. Concurrently with this task, the field artillery will provide continuous support to the maneuver elements, delivering either nuclear or nonnuclear fires as required.

b. Acquiring Nuclear Targets. All available target acquisition means will be exploited in locating nuclear targets. At division and corps levels, these means will include ground and air observers, electronic and mechanical means, and reconnaissance and intelligence-gathering agencies such as patrols and stay-behind elements. The location of hostile nuclear artillery is of primary concern.

c. Deployment

(1) Although centralized control is desirable, distances and deployments may dictate decentralization. When decentralization is necessary, field artillery may be attached to maneuver elements.

(2) Units not used to deliver nuclear fires should be disposed in depth—

(*a*) To support maneuver elements in action against enemy penetration or infiltration.

(*b*) As a passive measure against nuclear attack.

(*c*) To provide for field artillery unit replacement.

(*d*) To support maneuver elements in subsequent phases of the operation.

8–24. Army and Corps Artillery

a. The bulk of the field artillery missile units are at army and corps artillery levels. These nuclear delivery means are employed to the maximum extent possible in the nuclear battle.

b. The ranges of certain nuclear field artillery weapons and their employment over extended distances may dictate attachment of army field artillery units to corps and attachment of some corps field artillery units to division.

c. Shorter range nuclear field artillery units will require firing positions relatively near the forward edge of the battle area (FEBA). In addition, these units will require assembly areas and firing positions deeper in the zone. Nuclear field artillery units in the forward area should be so positioned as not to present lucrative target complexes to the enemy.

d. Firing positions for missile units will be selected to assist in the accomplishment of their missions. Priority for occupation of these positions will be in accordance with the plan for fire support.

e. Some nonnuclear cannon field artillery units will be positioned in depth for the purpose stated in para 8–23*c*(2) and may be out of range of the forward edge of the battle area. These units will be positioned to support maneuver forces deployed at relatively great depths.

8–25. Division Artillery

Division artillery weapons consist of cannon and rockets. The general considerations outlined for army and corps artillery weapons apply equally to similar weapons at division artillery. Additional considerations concerning employment of the division artillery in nuclear combat are discussed in *a* and *b* below:

a. Direct Support Battalions. Direct support battalions may be attached to major combat elements. Their position areas will be determined by the deployment and mission of the supported force.

b. Other Artillery. Division artillery units not assigned a mission of direct support are employed by the division commander in a manner to insure maximum participation in the nuclear battle consistent with the capabilities of the weapons. Rocket units may prepare numerous firing positions in the forward area and, to a lesser degree, in depth. In general, nuclear cannon units will be employed throughout the depth of the zone.

8–26. Brigade Level

a. General. In a fluid operation, time is of the essence in the target acquisition-mission processing-weapon delivery cycle. The nature of the targets and the range and speed of the acquisition and delivery means call for decentralized firing authority and streamlined processing procedures. Figure 8–1 shows the brigade processing phases for special ammunition.

b. Target Acquisition Capability. Before nuclear fires can be planned, suitable targets must be acquired. An analysis of one example—a typical target array of an aggressor motorized rifle division—showed that 80 percent of the targets were within the brigade area of influence and that 20 percent were beyond the brigade area of influence, but within the division area of influence. Of all targets within the division area of influence, 30 to 50 percent can normally be acquired in a 24-hour period.

c. Types of Targets and Threat. Targets considered suitable for nuclear attack at brigade level are those targets that pose a distinct threat to the brigade's mission. The brigade is concerned primarily with enemy nuclear delivery units and troop units of company size or larger. Smaller units normally are not of sufficient importance to the brigade to warrant the expenditure of a nuclear weapon. The brigade commander must assign priorities to targets.

d. Target Stay Time. The stay time of dismounted enemy company- and battalion-size units is short. The stay time of mechanized and armored units is even shorter. Consequently, rapid target acquisition and identification, target analysis, and delivery of fire are essential.

e. Response Time of the Delivery Means. Because of the mobility and short stay time of targets suitable for nuclear attack at brigade level, quick response is imperative. The use of appropriate tactical missions and fire request channels reduces response time.

f. Target/Weapon Compatibility. The radii of effects of low-yield and very-low-yield nuclear weapons are such that these weapons are ideally suited for employment against company- and battalion-size units.

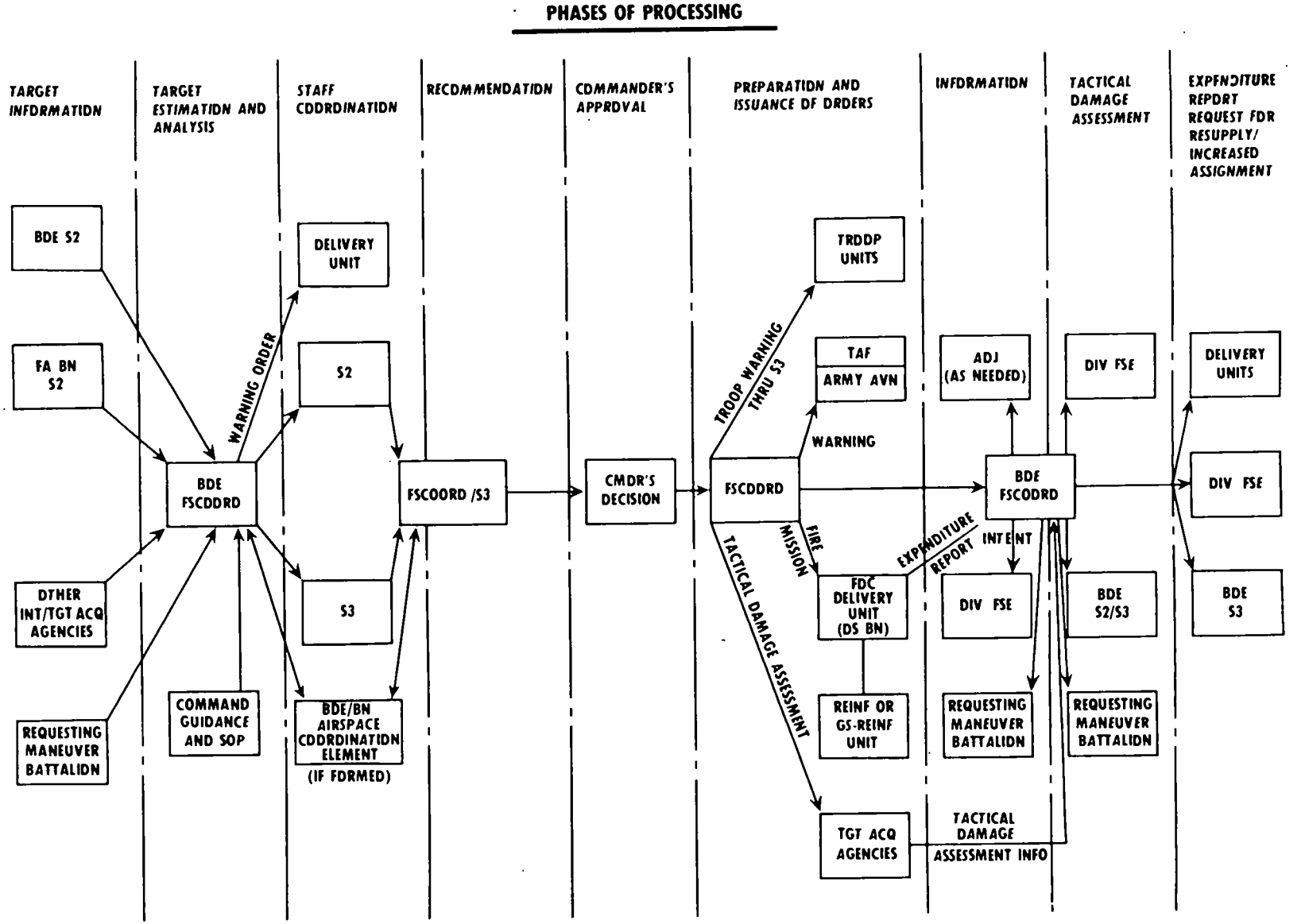
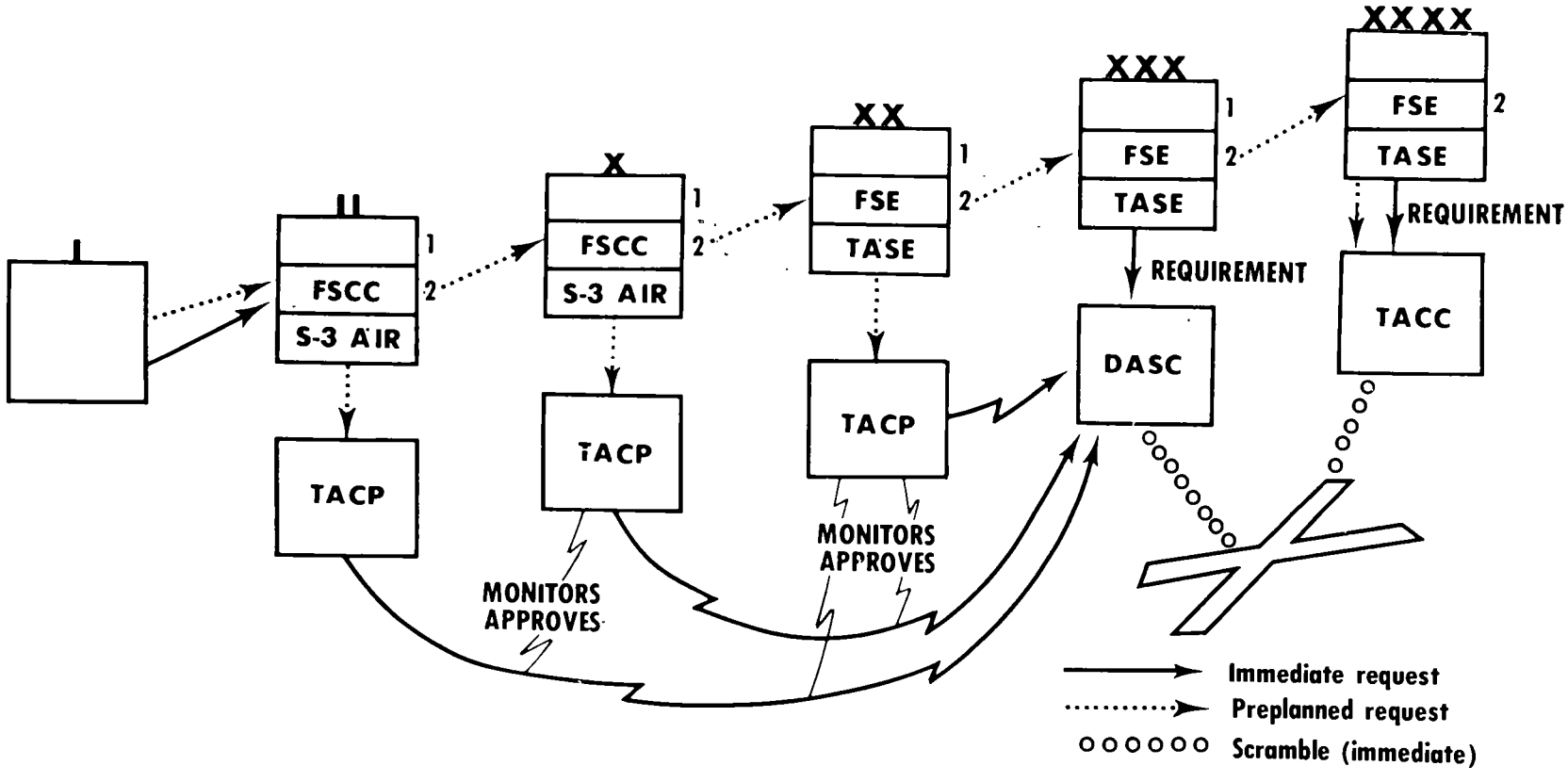
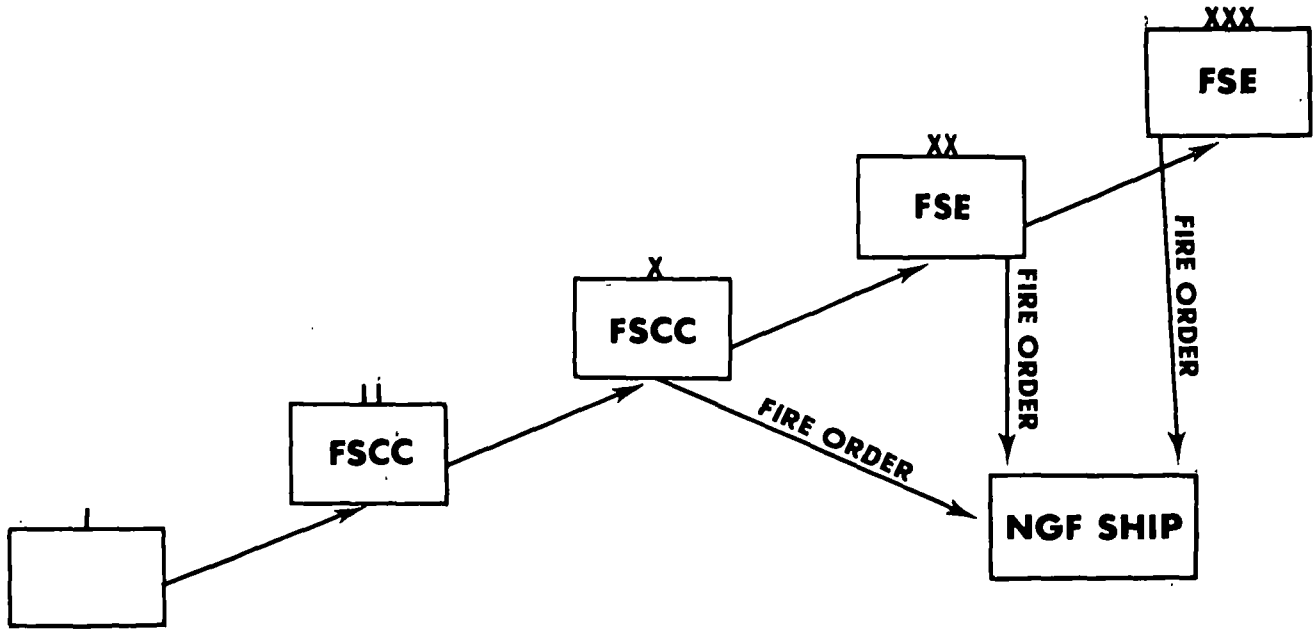


Figure 8–1. Brigade special ammunition processing phases.



1. Assumes commander has been assigned on an air delivered weapon. Requests must be processed through successive maneuver channels until they reach the commander who has been assigned the weapon requested.
2. Analyzes target, gains commander's approval, issues intent and warnings, passes requirement to S3/G3 air for aircraft and S2/G2 for tactical damage assessment aircraft requirements.

Figure 8–2. Request channels for Air-Force-delivered special ammunition.



NOTE: The request stops at the echelon which has authority to expend a weapon that can obtain the desired results. Command approval is required.

Figure 8-3. Request channels for Navy-delivered special ammunition.

g. Troop Safety. The minimum safe distances (MSD) of low-yield and very-low-yield nuclear weapons are such that in most cases the only friendly units that will be affected are those units under brigade control or in support of the brigade. The exceptions are Air Force and Army aircraft, which can be warned through communications available to the brigade.

h. Analysis, Processing, and Coordination Procedures. Because of time limitations and the absence of details on the composition and precise internal disposition of most targets, target analysis may be conducted by use of the visual method and pre-cut template. Attention must be given to troop safety, and a quick determination must be made of the effects of chemical downwind hazard and of induced contamination, tree blowdown, and fallout (in the event of an inadvertent surface burst) on maneuver elements. The analysis is performed in the brigade FSCC by the fire support officer, who is a trained target analyst. When the decision to fire has been made by the brigade commander, the mission is processed through field artillery fire control channels to the delivery unit capable of responding. The notification of intent to fire is transmitted to the division tactical operations center through either operational (G3) or fire support coordination communication channels and to adjacent brigades through lateral communication or by relay from the division tactical operations center. Request channels are shown in figures 6-5, 8-2, and 8-3.

8-27. Employment of Field Artillery Subsequent to Nuclear Engagements

a. Following a nuclear engagement, the field artillery supports the maneuver elements with nonnuclear fires as required. The field artillery continues to maintain nuclear superiority over enemy nuclear artillery throughout the area of influence of the supported force commander.

b. The battle for nuclear superiority may result in extensive losses in field artillery personnel and equipment. In order to provide field artillery support under these adverse conditions, field artillery commanders must be prepared to—

(1) Decentralize control to the degree dictated by the situation.

(2) Operate with limited logistical support.

(3) Improvise command and administrative structures.

(4) Replace or reconstitute ineffective units.

Section VI. FIELD ARTILLERY IN CHEMICAL OPERATIONS

8–28. Commander's Guidance for Employment of Toxic Chemical Weapons

The commander's basic guidance for the employment of toxic chemical weapons should be included in the unit SOP. The guidance should provide information similar to that contained in the commander's guidance for employment of nuclear weapons (para 6–35).

8–29. Basis of Employment

a. Determination of the level at which toxic chemical weapons will be employed is based on the factors given in paragraph 8–24 for nuclear weapons.

b. Toxic chemical agents may be employed to assist the field commander in accomplishing his mission. Plans for the employment of these agents to support tactical operations are integrated with the scheme of maneuver. In the fire support annex, toxic chemical fires may be integrated with other planned fires, or may appear in a separate chemical fire support appendix.

c. Toxic chemical weapons are effective against personnel protected from blast and fragmentation effects of other weapons.

d. In considering the distribution of chemical fires within the battle area, the commander and his staff are concerned with chemical contamination. The area of the residual chemical contamination is relatively small. The contamination is usually limited to the target area. The hazard may vary from nuisance effects to varying degrees of casualty-producing effects. Troop safety will depend on the protective posture assumed by the friendly forces. See FM 21–40 for details on mission-oriented protective posture (MOPP).

e. In defensive operations, toxic chemical agents may be employed to produce casualties, slow down or canalize the enemy attack along avenues of approach favorable to the defender, and force the enemy into dispositions that facilitate friendly counterattack. Extreme care must be exercised in the use of toxic chemical agents to avoid creating hazards to friendly troops.

f. Details concerning the employment of field artillery in toxic chemical operations are given in FM 3–10.

8–30. Coordination

When militarily significant, toxic chemical weapons effects are predicted to extend beyond a brigade zone or sector, coordination with the adjacent commander is required.

8–31. Capabilities

a. Field artillery is capable of delivering toxic chemical agents on hostile targets. Toxic chemical agents provide the commander with a means of target neutralization which may be used alone or in conjunction with other fires.

b. The capabilities of the delivery systems and the characteristics of the agents must be considered in determining the most suitable weapon system for attack. Nonpersistent agents should be delivered as surprise fire to achieve maximum results; persistent agents can be placed on the target over a period of time. To gain the full value of the element of surprise, field artillery uses the time-on-target (TOT) technique in delivering nonpersistent agents.

c. The 4.2-inch mortar is capable of delivering chemical agents. The use of mortars in the chemical role should be coordinated by the FSCOORD.

CHAPTER 9

FIELD ARTILLERY TARGET INTELLIGENCE

Section I. GENERAL

9–1. General

The combat intelligence function of the field army results in two basic intelligence products: Decision-oriented intelligence and target intelligence. The force commander employs decision-oriented intelligence in the design and execution of maneuver; he employs target intelligence in the application of firepower. Both types of intelligence emerge from the same broad collection effort of the combat intelligence function, but target intelligence poses more exacting requirements for accuracy and timeliness. In this chapter target intelligence and target acquisition are discussed. A detailed discussion is contained in FM 6–121.

9–2. Definitions

a. Field artillery target intelligence is the knowledge acquired through the collection, processing, and dissemination of all information pertaining to potential or actual targets.

b. Target acquisition is that part of the intelligence activities which involves accurate and timely detection, identification, and location of ground targets to permit the effective employment of supporting weapons.

Section II. TARGET INTELLIGENCE

9–3. General

A thorough development of field artillery target intelligence is necessary for the proper employment of field artillery units, the timely and effective delivery of fire, and the coordination of movement and fire support with the supported unit and other supporting arms. The efficiency with which the field artillery fulfills its mission depends largely on adequate and timely target intelligence.

9–4. Collection of Target Information

a. General. All collection agencies available to the commander must be impressed with the requirement to provide complete and accurate target information in order to satisfy the needs of users. Timeliness in acquiring targets is absolutely essential, since the enemy will try to avoid presenting lucrative targets and those presented will be as transitory as possible. Visibility diagrams should be required of all forward observers and all radar positions. These diagrams will establish which areas are not under line of-sight for ground observation and will indicate where sensors and aerial observers may be required.

b. Collection Means Available. Several means are available to aid the field artillery commander in the collection of target information. Reports from radar, sound ranging, flash ranging, shell reports, unattended ground sensors, signal intelligence resources, and general surveillance must be included in a collection plan. The force G–2 (or S–2), in discharging his responsibility for development of the collection plan, makes full use of field artillery agencies in collecting combat intelligence. The discharge of this responsibility is enhanced by the artillery's extensive communication system, target acquisition equipment, and ability to coordinate numerous observers; and by the field artillery's system of providing fire support officers at each maneuver battalion and brigade headquarters.

9–5. Processing Target Information

a. General. Processing is the means by which target information is transformed into target intelligence. Target intelligence must be sufficiently detailed to permit—

(1) An analysis of the target to determine the most effective weapon or warhead for use against the target.

(2) An evaluation of the importance of the target in relation to the mission of the command.

(3) An evaluation of the effect that the attack of the target will have on future acquisition of intelligence.

(4) An evaluation of the effect of attacking the target now versus the effect of a later attack of the target.

b. Basic Elements. Recording, evaluation, and interpretation are the basic elements of processing. These elements are discussed in detail in paragraphs 4–6 through 4–10, FM 6–121.

9–6. Dissemination of Field Artillery Target Intelligence

a. General. Once intelligence has been produced, it is disseminated for use in the accomplishment of the mission. The most suitable means available are used to disseminate the intelligence.

b. Documents.

(1) Intelligence documents used to disseminate intelligence are discussed in FM 30–5 and FM 6–121.

(2) The United States Armed Forces have ratified the details of agreement of STANAG 2008, Bombing, Shelling, and Mortaring Reports. When US Armed Forces operate as a part of NATO forces, the instructions given in STANAG 2008 will be followed. The details of agreement and instructions of STANAG 2008 are contained in FM 6–121.

c. Use. Field artillery intelligence is used to determine the enemy's capabilities and probable courses of action and to assist the field artillery commander in the destruction or neutralization of confirmed targets in advising the force commander on fire support and in the attack of suspect targets. Field artillery intelligence is used extensively in fire support planning, and is discussed in chapter 10.

Section III. TARGET ACQUISITION

9–7. General

Field artillery target acquisition agencies are part of the intelligence-gathering agencies of the force as a whole and, as such, are a major component of the combat intelligence system at all echelons.

9–8. Function and Objective

a. Target acquisition results from applying information collected from all sources and agencies for a special purpose. The primary function of field artillery target acquisition agencies is to gather and process target information of importance to field artillery operations.

b. The principal objective of the target acquisition effort is to achieve predicted fire capabilities for first-round effectiveness. The effectiveness of field artillery fires will depend largely on the accuracy, completeness, and timeliness of target acquisition.

9–9. Types

a. There are two types of target acquisition—direct and indirect. *Direct* target acquisition refers to target acquisition data obtained by one target acquisition means. *Indirect* target acquisition is the development of target data from an evaluation of target information supplied by two or more means.

b. Both types of target acquisition are used to detect, identify, and locate targets. Detection consists of ascertaining the existence or presence of a target. Identification consists of determining the nature, composition, and size of the target. Location consists of determining the three-dimensional coordinates of the target with respect to known points or weapons, i.e., with respect to a common grid. Location requires greater accuracy for target acquisition purposes than for general intelligence purposes.

9–10. Systems

a. General. A target acquisition system consists of the equipment and personnel necessary to perform target acquisition. There are two major types of target acquisition systems—ground systems and aerial systems.

b. Ground Systems.

(1) Visual (forward observers, observation posts, and flash ranging).

(2) Radar (countermortar, counterbattery, and moving target locator).

(3) Sound ranging.

(4) Unattended ground sensors (UGS).

(5) Communications and electronic intelligence.

c. Aerial Systems.

(1) Visual.
(2) Photographic.
(3) Radar.
(4) Infrared.
(5) Communications and electronic intelligence.

d. References. For a complete discussion of target acquisition systems, see FM 6–121. Ground radars are discussed in detail in FM 6–160, FM 6–161, and FM 6–162. Sound ranging and flash ranging are discussed in detail in FM 6–122. Aerial surveillance and reconnaissance assets and capabilities/limitations are discussed in detail in FM 30–20.

9–11. Considerations

a. Environmental conditions impose a wide and varying range of limitations on each target acquisition means employed. In order to insure continuity of the target acquisition effort, complementary target acquisition means must be used to insure the effectiveness of the means in day and night operations under all environmental conditions.

b. The techniques involved in transmitting and processing target data determine to a great extent the speed with which targets can be engaged. Targets capable of displacing rapidly and/or imposing a serious immediate threat to the security of friendly forces must be engaged as soon as possible after they have been acquired. Therefore, all possible measures must be instituted to reduce to a minimum the time required to transmit and process target data.

c. Operational characteristics also impose limitations on each means employed. Normally, these limitations do not reduce the speed with which targets can be engaged.

Section IV. TARGET ANALYSIS

9–12. Prestrike Analysis

a. The force commander provides guidance for the accomplishment of target analysis by announcing the priorities for attack of targets, the desired level of damage or casualties to be obtained, and the degree of risk to be assumed. Targets of opportunity, as well as planned targets, are analyzed.

b. All targets are analyzed as soon as they are located. The analysis of a target of opportunity may consist of no more than a rapid mental calculation by the appropriate artillery echelon to insure timely, accurate, and effective fires on the target. The analysis of a target on which fires are planned for some future time is more deliberate. The length of time and the amount of detail involved in making a target analysis depend on the amount of information available concerning the target, the means available that are suitable for the attack of the target, the degree of coordination required, and the urgency for attacking the target.

c. For nuclear target analysis methods, see the FM 101–31-series. For toxic chemical target analysis methods, see FM 3–10.

9–13. Mission of Supported Force

a. The basic considerations in making a target analysis are the concept of operations and the priorities for attack of targets announced by the commander. Supporting firepower is employed to aid in the accomplishment of the mission. The importance of the target, measured by its capability to influence the operation, is a major consideration.

b. Because of the effect of firepower, the integration of fires with the scheme of maneuver or plan of defense is necessary. Although the fire support coordinator (FSCOORD) is responsible for insuring the correct amount, the proper distribution, and the coordination of all fires on appropriate targets in the planning and execution phases of the operation, the force G3 is responsible for insuring that firepower supports and is integrated with the scheme of maneuver or plan of defense.

c. The standing operating procedures (SOP) and the policies of the commander concerned must be considered as soon as a target analysis is initiated. The SOP and the policies of the commander must be well known to all fire support coordination agencies to insure the rapid and efficient engagement of targets.

9–14. Determining the Military Importance of a Target

a. The military importance of a target is determined by an evaluation of the threat or potential

threat the target presents to the accomplishment of the mission. The military importance attached to a target is valid only at the force level at which the analysis is made. For example, a hositle machinegun analyzed at a maneuver company may be considered a formidable threat to the accomplishment of that company's mission. The same machinegun analyzed at manuever battalion will be considered a much smaller threat to the accomplishment of the battalion's mission. The same weapon analyzed at division will probably be considered a relatively insignificant threat to the accomplishment of the division's mission.

b. The following four priorities are used as a guide in determining priorities for attack of targets.

(1) *Priority I.* Targets immediately capable of preventing the execution of the plan of action are considered priority I targets.

(2) *Priority II.* Targets capable of immediate serious interference with the execution of the plan of action are considered priority II targets.

(3) *Priority III.* Targets capable of ultimately serious interference with the execution of the plan of action are considered priority III targets.

(4) *Priority IV.* Targets capable of limited interference with the execution of the plan of action are considered priority IV targets.

c. All available intelligence concerning a target must be considered in determining its military importance. When additional information becomes available, the target must be reevaluated. Based on the reevaluation, the priority for attack of the target may be upgraded, downgraded, or may be unchanged.

d. A current target list showing the current military importance of each target is an invaluable aid to the fire planner. Using the target list, the fire planner can readily identify the most important targets and can rapidly plan or initiate fires on them for preparation, counterpreparations, and the various programs of targets. The target list also serves as a reference document from which to brief the commander in meaningful terms on such items as the total number of targets located, the number of targets that can prevent the execution of the mission of the force, and the number that can cause immediate serious interference. This developed field artillery intelligence provides vital information to the force for the conduct of current operations and the planning of future operations.

9–15. Determining the Precedence of Attack

a. Sufficient fire support means rarely are available to attack simultaneously all the targets that should be attacked. Of necessity, the attack of targets is spread over a period of time. Frequently, because of such factors as an insufficient amount of ammunition, an insufficient number of delivery units, or both, it is necessary to determine the relative precedence of attack of targets. The FSCOORD recommends the precedence following coordination with the appropriate intelligence representative present.

b. In determining the precedence of attack, consideration should be given to the military importance (priority) of targets (para 9–14). A target assessed as priority I should have precedence over a target of lesser importance.

c. Other important considerations in determining the precedence of attack of one target over another are as follows:

(1) *Target characteristics.* Target characteristics which should be considered include, but are not limited to, the—

(*a*) Composition.
(*b*) Size and shape.
(*c*) Vulnerability.
(*d*) Mobility.
(*e*) Recuperability.

(2) *Target location.*

(*a*) Proximity of the target to friendly troops.

(*b*) Accuracy of the target location.

(3) *Terrain and weather.*

(*a*) *Terrain.* The terrain in the target area has a direct bearing on the vulnerability of a target. Rugged terrain affords considerable natural cover and makes target location difficult. Targets in defilade sometimes can be reached only by high-angle fire or by aircraft. Certain terrain provides complete defilade from some angles of approach but not from others, thereby influencing the selection of a means of attack. Frequently, it may be necessary to move a weapon to a position from which it can deliver effective fire on the target. The nature of the vegetation in the target area should be considered in the selection of ammunition. Information as to ground relief, surface conditions, and vegetation in the target area is desirable in considering nuclear attack. Uneven terrain limits sound ranging coverage, reduces radar coverage, and may reduce the effect of nuclear weapons. Exact up-to-date information on terrain in the target area may be obtained from aerial imagery. Imagery interpreters are available

at division level and higher to assist the weapons analyst in making terrain analysis.

(*b*) *Weather.* Weather greatly affects the capability of attack by air and, to a lesser degree, by naval gunfire and field artillery. Weather is of particular importance in evaluating a target to be attacked with special ammunition, smoke, or illumination projectiles. Knowledge of the current meteorological conditions (visibility at ground level, amount of cloud cover, and height of the ceiling) is an important requirement.

(*c*) *Joint effects.* Terrain and weather jointly affect visibility of the target, and further study may be required to determine a suitable means and method of attack.

d. After target priority and precedence of attack are determined, a tentative decision is made as to the type of effect and degree of damage desired. The tentative decision will be confirmed if suitable weapons and ammunition are available.

9–16. Determining the Most Suitable Weapon/Ammunition

a. General. The characteristics of available fire support means must be considered to determine which is most capable of producing the desired effect on the target. A less capable means may be used if time or ammunition limitations preclude the use of a more effective means. The 6–141-series field manuals are a valuable aid in determining the best weapon system and the amount of ammunition for the engagement of targets. The two terms most commonly used to describe desired effects of fires are—

(1) *Destroy.* Fire delivered for the sole purpose of destroying materiel objects.

(2) *Neutralize.* Fires which are delivered to hamper and interrupt movement and/or the firing of weapons and to render personnel or materiel incapable of interfering with a particular operation.

b. Firepower. The fire support means selected must be capable of producing the desired effect on the target without causing excessive undesirable effects on the target and in the target area.

(1) *Weapons.* The caliber, type, and rate of fire of each available weapon must be considered. The desired effect may be achieved by one weapon. However, more than one weapon of the same or of different types may be required.

(2) *Ammunition.* The target may dictate the type and amount of ammunition to use. Neutralization and harassment of a target can be achieved by fires of lesser intensity than those required for the destruction of a target. The available supply rate and the availability of special weapons are always considered. The greatest effect possible must be achieved for the amount of ammunition expended.

(3) *Personnel targets.* The attack of personnel in the open by light field artillery, light naval weapons, and fighter bombers is appropriate. Improved conventional ammunition and projectiles and fragmentation bombs with variable time fuzes are effective against personnel in the open. Nuclear and toxic chemical fires are the greatest casualty producers, but their employment may be limited to the most profitable targets. Fallout may be used to produce casualties over a wide area.

(4) *Defensive works.* The heavier weapons are best suited to the destruction or neutralization of bunkers, pillboxes, dugouts with heavy overhead cover, and other defensive works. Chemical agents are effective in neutralizing these positions. For penetration capabilities of various weapons, see chapter 27, FM 6–40.

(5) *Materiel targets.* Materiel targets may be rendered ineffective by neutralization of the operating personnel or by destruction of the materiel itself. Materiel targets are frequently accompanied by personnel and require attack by a fire support means capable of achieving the desired effect on both target elements. Heavy cannon, antitank and similar missiles, heavy naval weapons, or air bombardment are usually required for the destruction of heavier types of materiel. Properly delivered nuclear fire is effective against all materiel targets. Toxic chemical weapons may be used to contaminate materiel targets and neutralize operating personnel.

(6) *Large target areas.* Frequently, several targets are located in one large area. Nuclear fires (to include effects from fallout) and toxic chemical fires can be used against a large area when adequate coverage of the area is beyond the capability of conventional ammunition, or when an excessive quantity of conventional ammunitions would be required to achieve the desired result.

c. Troop Safety. The fire support means selected must be capable of engaging the target without adversely affecting friendly troops. The importance of accurate delivery of fire close to friendly lines must be emphasized. Supported troops must have confidence in fire support and this confidence must be carefully fostered.

(1) *Accuracy of the means.* The means selected must be sufficiently accurate to accomplish the desired results. Generally, weapons with large probable errors are not used for close fires. All gunfire and airstrikes in close proximity to friendly troops must be adjusted or given special consideration. Close-in targets for airstrikes should be carefully marked, the location of friendly troops should be given to the aircraft, and the strikes should be controlled by an air controller in the air or on the ground.

(2) *Effects on target area.* If friendly troops are to move into an area immediately after the delivery of fire, the effects of the fire must not deny movement or safe passage of the troops. Lingering effects from a nuclear or chemical attack must be considered. Over destruction of the target may create obstacles to the passage of infantry and armored elements and thereby strengthen the enemy defenses.

(3) *Effects of weather.* The weather conditions in the target area must be considered in relation to troop safety. A wind blowing toward friendly troops may prohibit close nuclear or chemical fires. Areas of heavy vegetation, if flammable, may be ignited by incendiaries, and the resultant grass and timber fires may jeopardize friendly troops.

d. Time Requirements. The time required for the delivery of fire, after the target information is available, depends on the following four primary factors:

(1) The time required to process the target information, perform target analysis, and reach a decision as to the most suitable weapon and ammunition for attack of the target.

(2) The time required to compute firing data and to secure command approval in situations not covered by directives, guidance, or policies.

(3) The time required to warn troops and aircraft within the radius of weapon effects.

(4) The reaction time of the selected weapon system. Reaction times vary with the weapon systems and with the state of readiness of the weapons with the systems. Nonnuclear field artillery is the most responsive fire support means. The response time of tactical air depends on the operational status of the aircraft. The air alert status insures greater responsiveness than the ground alert status but is costly. The ground alert status insures maximum use of available air support. The reaction times of nuclear delivery systems vary with the complexity of the systems.

9-17. Determining the Method of Attack

When the type and amount of firepower and the means of delivery have been determined, the best method of attack must be determined. The factors which determine the method of attack are discussed in *a* through *d* below. Additional data concerning methods of attack are contained in the 6-141-series field manuals. See appendix O for the classification of targets and the standard methods of attack.

a. Location of the Mean Point of Impact. In a small target area, the fire is placed on the center of the area. In a large target area, separate mean points of impact (MPI) may be selected to insure adequate coverage. The terrain in the target area is studied, and fire is placed to minimize the protection afforded the enemy by natural cover. The determination of the suitable height of burst is important to the success of a nuclear attack and to some chemical attacks.

b. Surprise Fire. The effectiveness of field artillery fire is best exploited by the delivery of fire without adjustment to obtain surprise. Surprise reduces the effectiveness of enemy protective measures and countermeasures. The principal method of obtaining surprise is to place a large amount of fire, either nuclear fire or time-on-target (TOT) conventional fire, on an area in a short period of time. The TOT method requires that initial fires arrive at the target simultaneously from several units. Success depends on accurate survey, registration, and the application of meteorological corrections. If the number of units available is not sufficient for effective TOT fires, the use of weapons with high rates of fire is desirable. Surprise toxic chemical fires are used to produce casualties before the enemy can mask.

c. Density of Fire. In most situations, uniform density of fire on all parts of the target area is desirable. Methods of obtaining uniform density of fire are to use one unit to attack parts of the area successively (e.g., searching or sweeping fire) or to use several units to attack simultaneously. The latter method is more effective.

d. Duration of Fire. Although intense fire of short duration produces a greater number of casualties than fire of less intensity and greater duration, the mission may require fire on a target over a long period of time. The availability of ammunition frequently influences the duration and intensity of the fire, such as in harassing and interdiction fire, in which the objective is to cur-

tail movement, to disrupt or intermittently deny the use of communication routes to the enemy, and to keep the enemy unnecessarily alerted, all of which impair morale and efficiency. Toxic chemical fires may be employed over a long period of time against targets which have no protection available.

e. Standard Methods of Engagement. See appendix O for the classification of targets and the standard methods of engagement.

9–18. Tactical Damage Assessment

a. Tactical damage assessment is a postattack examination of the target area to appraise the effect of fires. The examination is conducted to determine whether the balance of the tactical plan can be implemented or whether additional special or conventional fires are required. The examination of the target area is made by the available surveillance means. Answers to the following questions are required:

(1) Was the fire accurate?

(2) Was the enemy in the area of impact?

(3) Were significant obstacles created?

(4) Were the desired results achieved?

b. The information for tactical damage assessment can be obtained—

(1) From target acquisition agencies.

(2) By imagery interpretation.

(3) By inspection of the target area after its capture.

(4) From enemy prisoners of war, civilian internees, detainees.

(5) From captured documents, reports, diaries, and letters.

(6) From friendly civilian personnel who observed the results of the fires.

(7) By clandestine means.

(8) By communications and electronics intelligence means.

c. Tactical damage assessment is a responsibility of the headquarters ordering the fires and may be made by any agency capable of obtaining the necessary information. The fire support annex may contain instructions for tactical damage assessment.

d. Field artillery agencies may make the tactical damage assessment reports and then forward them to the supported command and to the field artillery intelligence representative. All pertinent information is disseminated to higher, lower, and adjacent echelons. Pertinent data from the reports are entered on approprate file cards. These data are analyzed to determine the comparative effectiveness of field artillery weapons, techniques, and ammunition in the attack of specific types of targets. The field artillery commander uses his knowledge of enemy doctrine and field practices to increase the effectiveness of field artillery fires.

e. Whenever possible during offensive operations, field artillery representatives should make on-the-spot inspections of former target areas as they are uncovered. Such inspections will confirm (deny) the validity of previous postattack information and thus allow the development of experience factors for future use.

Section V. UNATTENDED GROUND SENSORS

9–19. General

Unattended ground sensors (UGS) provide timely and accurate indications of targets suitable for attack by field artillery. The basic considerations for planning for sensor-acquired targets will be discussed in this section. In order to respond effectively to sensor-acquired targets, the field artilleryman must possess a detailed knowledge of the various types of sensors and the methods of employing them. This information is contained in FM 31–1 (Test).

9–20. Sensor Employment

Sensors are employed in various configurations termed "fields." These fields are selected after analysis of the terrain, enemy activity, and friendly positions. The selection of the sensor field location is closely coordinated between the maneuver commander and the field artillery commander to insure enhancement of the scheme of maneuver and the plan of fire support. The field artillery S2 has staff responsibility for planning the field artillery employment of unattended ground sensors for the collection of target information. The fields are linked to a monitor station which receives indications of the presence of a target, and passes these indications to the maneuver and fire support agencies.

9–21. Fire Planning Considerations

a. The location of the sensor field, and each

sensor within the field, is made available to the fire direction center, fire support officer, and maneuver unit operations center. Target numbers are assigned by either the fire support officer or the fire direction center. These numbers are assigned, in coordination with the sensor monitor station, to either selected sensor locations or other points inside or outside the field where artillery fire may be applied as a result of sensor activity.

b. An analysis of the sensor field is made by the DS battalion S2, and recommendations are made to the fire support officer and DS battalion S3 concerning which targets are to be attacked upon activation of the sensor field. These targets are fired in as soon as possible and the adjusted data kept current by the application of gunnery techniques. The type of ammunition, fuze, and method of fire, are determined by terrain analysis and the commander's guidance.

c. To assist in fire support for sensor activations, a quickfire channel is established among the sensor monitor station, fire support officer, and fire direction center. This channel may be an existing fire direction net, wire line, or face-to-face communications, depending upon the location of the various agencies.

9–22. Commander's Guidance

The maneuver commander may delegate the authority to automatically attack selected sensor targets upon notification of activation to the fire direction center, or he may reserve that decision to himself for individual activations. The field artillery commander may publish standard methods of attack for each sensor field, or he may delegate the authority for that decision to the fire support officer, or to the DS battalion S3. Because of the fleeting nature of sensor-acquired targets, the commander's guidance should be disseminated as widely as possible in order to avoid excessive delays. Consideration must be given to the vulnerability of sensors to jamming and, especially, to deception. Whenever possible, sensor activations should be checked against collateral sources to avoid reacting to deliberate enemy deception.

9–23. Damage Assessment

Every effort should be made to inspect the sensor area immediately after attack in order to further identify and maintain surveillance of the target, and to determine the effectiveness of the fires. The maneuver commander may desire to send in patrols or use air cavalry units, and the field artillery commander may use aerial observers to assist in the assessment.

CHAPTER 10

FIELD ARTILLERY FIRE PLANNING

(NATO STANAG 2029, CENTO STANAG 2029, SEATO SEASTAG 2029, NATO STANAG 2031, CENTO STANAG 2031, SEATO SEASTAG 2031, NATO STANAG 2088, CENTO STANAG 2088, ABCA QSTAG 108)

Section I. GENERAL

10–1. General

a. The mission of the field artillery is to provide close and continuous field artillery support to the force commander by dstroying or neutralizing, in priority, those targets that jeopardize the accomplishment of his mission. The field artilleryman must know how to use his weapons to their full capabilities, how to organize field artillery units for combat, where to position the units, and how to plan field artillery fires to support the ground-gaining arms. Because field artillery officers serve as FSCOORD, they must be familiar with other fire support (Naval gunfires and fires from aircraft) systems and procedures. Through the use of fire support planning and execution, which represents the integrated, coordinated efforts of all fire support means, the fire support coordinator (FSCOORD) provides the ultimate in fire support to the maneuver force. Field artillery fire planning is conducted at all levels—company, battalion, brigade, division, corps, and army. Since it is the field artillery's responsibility to prepare the field artillery fire support appendix and coordinate all fire support on surface targets, the field artilleryman must know the techniques and procedures involved.

b. The fire support annex is as detailed as possible, depending on the time available, the number and accuracy of target locations, the type of operations in which the supported unit is engaged, the fire support requirements of the higher echelon, and the fire support means available.

c. Fire support and maneuver are complementary. Success in combat depends on the proper planning and execution of both fire support and maneuver. Fire support planning is a continuous process; it does not cease with the issuance of a fire support annex but continues throughout an operation.

10–2. Fire Planning Terms

Terms pertinent to field artillery fire planning are listed in appendix B.

Section II. TARGETS

10–3. Types of Targets

a. Definitions and Distinctions.

(1) The term "target" is used to indicate an area designated for attack by fire. Targets are numbered for future reference in accordance with the target numbering system. This number (together with its letters) identifies the planning source.

(2) All targets are either unplanned (targets of opportunity) or planned (scheduled targets and available on request (on-call).

(*a*) A target of opportunity is a target which has not been planned. Since a target of opportunity is generally fleeting in nature, it should be attacked as soon as possible. It can be attacked by shifting fire from a planned location or by conducting an adjustment on the target.

(*b*) A planned target is a target on which fire is prearranged. A planned target may be scheduled or on call. The purpose of planning is to permit accurate and timely attack of those targets capable of jeopardizing the accomplishment of the force's mission.

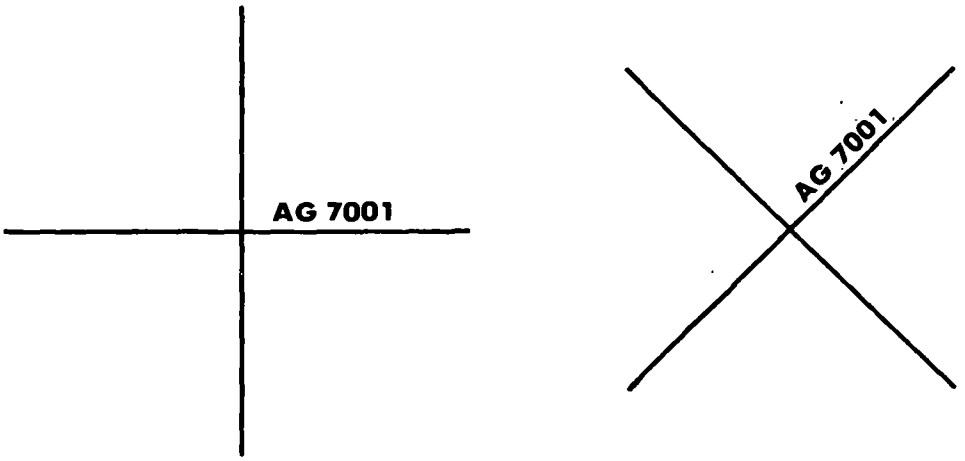


Figure 10–1. Target symbol.

1. A scheduled target is a target on which fire is to be delivered at a specific time. The time is specified in terms of minutes before or after a designated time or in terms of the accomplishment of a predetermined movement or task.

2. An on-call target is a planned target, other than a scheduled target, on which fire is delivered when requested rather than at a specific time.

3. Firing data for planned targets, including the degree of prearrangement necessary, must be determined by the field artillery S3.

(a) Data must be kept current for those targets on which fire for effect could be called immediately; e.g., final protective fires, targets in counterpreparation fire, counterbattery targets, counterflak targets, series of targets, groups of targets, and selected on-call targets.

(b) Basic firing data will be computed but need not be continuously kept current for those targets for which a definite time for firing has been established or will be established sufficiently in advance to allow computation of current data; e.g., preparation and harassing and interdiction (H&I) fires.

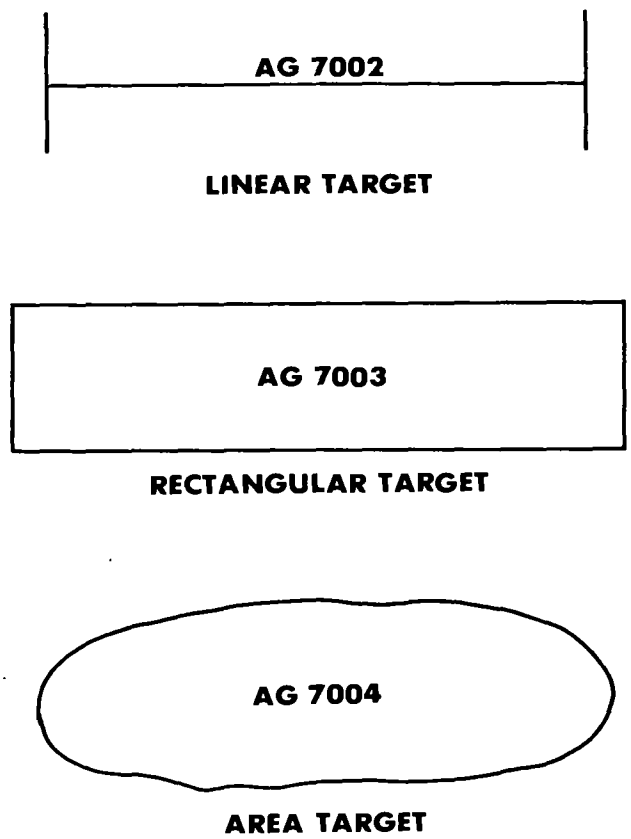


Figure 10–2. Special target symbols.

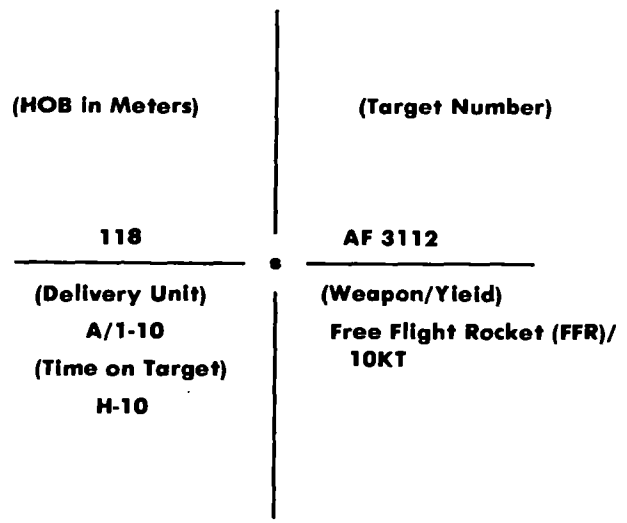


Figure 10–3. Special weapons target symbol.

(c) Data need not be computed in advance for such targets as terrain features or other reference points.

b. Target Symbols.

(1) The common symbol used in plotting a conventional target on a fire planning map or an overlay is depicted in figure 10–1. This symbol indicates the location of the center of the target. It does not indicate the size or type of target; this information is contained in the target list. The size and type of unit to attack a target will be determined by an analysis of the target, including its size, shape, composition, and vulnerability. The symbol may be canted to facilitate plotting several targets in close proximity to each other.

(2) Special symbols are used to make targets of unusual size or shape (fig 10–2). These symbols include the linear target symbol for long, narrow targets; the rectangular target symbol for rectangular targets; and the area target symbol for irregularly shaped targets. If the dimensions of the target exceed the width of an open sheaf or a depth of 250 meters, consideration should be given to creating multiple targets and including them in a group of targets, to firing zone fire, or to shifting fire.

(3) The symbol used for special weapons targets (fig 10–3) is the tick mark. In addition to the target number, information is included as to the weapon or weapon yield, delivery unit, time on target (TOT), and desired height of burst (HOB) in meters, when known.

c. Target Numbering System. The system of target numbering is explained in appendix C.

d. Group of Targets. A group of targets is two or more targets on which fire is desired simultaneously.

(1) A group of targets is graphically portrayed by circling the targets within the group and identifying the group with a group number (fig 10–4). The group numbers used by the FDC to designate a group of targets consist of the target designation letters assigned to the field artillery battalion (app C) with a number inserted between the letters. (Other nations may designate a group of targets by a nickname). For example, if a battalion is assigned the letters AG, the first group of targets is designated A1G; the second group, A2G; etc. The forward observer or fire support officer, seeing a need for a group of targets, will request that a group be planned by his FDC. The fact that a group of targets has been formed does not preclude the individual attack of targets within the group. The lowest field artillery echelon that may form and designate a group of targets is normally a direct support field artillery fire direction center.

(2) When a group of targets is planned on call, firing data for the targets in the group should be kept current.

e. Series of Targets. A series of targets is a number of targets or groups of targets planned to support a maneuver phase.

(1) A series of targets is graphically portrayed by circling the targets or groups of targets within the series and identifying the series with a nickname (fig 10–5). The fact that a series of targets has been formed does not preclude the individual attack of targets or groups of targets within the series. As with a group of targets, the lowest field artillery echelon that may form and designate a series of targets is usually a direct support field artillery fire direction center.

(2) A series of targets may be planned to support a limited attack, a final assault, or a counterattack. It should be planned to complement the maneuver. By design, a series of targets provides intensive, prearranged fires on the objective area. It may be initiated on call, at a specific time, or when a particular event occurs. Once a series is initiated, targets and groups of targets within the

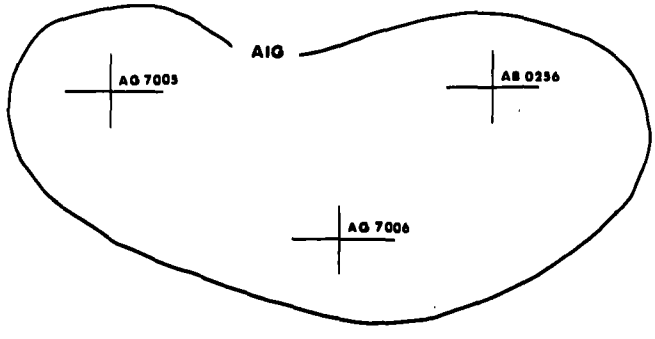


Figure 10–4. Group of targets.

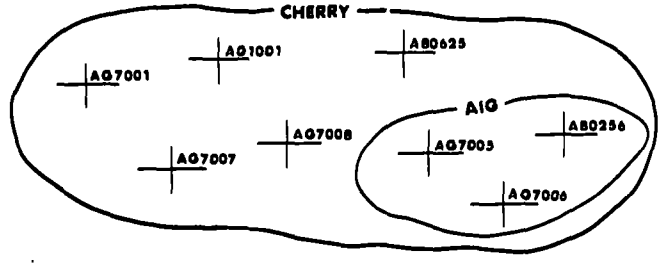


Figure 10–5. Series of targets.

series are usually fired on in accordance with a predetermined time schedule listed in an artillery fire support table.

f. Program of Targets. A program of targets is a number of planned targets of a similar nature. All targets in a particular program are of the same type; e.g., a counterbattery program planned against enemy indirect fire positions or a counterflak program against enemy air defense sites. A program of targets may be initiated on call, at a specified time, or when a particular event occurs. Once a program is initiated, targets within the program are usually fired on a predetermined time schedule listed in a field artillery fire support table. A program is usually designated by its nature (e.g., counterbattery) and given a nickname. The lowest echelon that normally designates a program of targets is the direct support field artillery.

10–4. Target Planning

Fires are planned to support the scheme of maneuver in accordance with the commander's concept of operations. Areas that should be covered by planned fires are confirmed enemy locations, suspected enemy locations, likely enemy locations, and prominent terrain features.

a. Confirmed Enemy Locations. Fires are planned on all confirmed locations of enemy forces and facilities that could hinder the supported unit's mission. Planning is accomplished without regard to boundaries or weapon capabilities. The time of firing on known targets depends on the tactical situation and on the potential threat of a particular target.

b. Suspected Enemy Locations. Suspected enemy locations are areas where activity has been observed, but whose exact nature and location have not been confirmed. Examples are locations contained in prisoner of war reports and shelling reports based on flash observation. Fires are planned on all suspect locations to facilitate rapid attack when a target is confirmed or when the exact nature and location of the target are determined. The time of attack is governed by the same criteria that are applied to confirmed enemy locations.

c. Likely Enemy Locations. Likely enemy locations are determined from a careful study of the terrain and available maps, and from a knowledge of the enemy's methods of positioning troops and weapons. Likely enemy locations include such areas as likely observation posts, troop positions, assembly areas, avenues of approach, and routes of withdrawal. Fires are planned on likely areas so that data will be available when and if the enemy occupies the areas.

d. Prominent Terrain Features. When the enemy situation is vague or there are few, if any, known or suspect targets, fires are planned on likely locations and on prominent terrain features such as hilltops, road junctions, manmade objects, and other locations easily identifiable on a map and on the ground. These targets provide reference points from which fires can be readily shifted to targets of opportunity. Firing data for these targets normally are not kept current, since fires will seldom be delivered on the terrain features. The number of these targets should be kept to a minimum.

Section III. FIELD ARTILLERY FIRE SUPPORT

10–5. General

Field artillery fire support is fire delivered by field artillery units to sustain the combat operations of the ground-gaining arms. There are three basic types of supporting fire—offensive fire, defensive fire, and fire which can be used in both the offensive and the defensive.

10–6. Offensive Fire

Offensive fire is fire delivered by supporting units to assist and protect a unit engaged in an offensive action. Fires in support of the offense are planned to engage targets before the preparation fire, during the preparation fire, and during the attack.

a. Fires Before the Preparation. Fires before the preparation include fires on targets of opportunity, fires to cover the deployment and movement of attacking troops, registration fires, and harassing and interdiction fires to restrict the enemy's movement and disrupt his command and control. Every effort is made to prevent premature disclosure of the impending attack.

b. Fires During the Preparation.

(1) Preparation fire is intense prearranged fire delivered in accordance with a time schedule

to support an attack. Preparation fire is designed to disrupt the enemy's communications, disorganize his defenses, and neutralize his fire support means. Preparation fire starts before, at, or after H-hour and continues until it is lifted, either on a prearranged time schedule or on request of the assault elements. Preparation fire may include conventional and special ammunition fires of air, ground, and naval means.

(2) Preparation fire is planned even though it may not be executed. The decision as to whether or not preparation fire will be fired and the duration of the fire is made by the force commander ordering the attack. For example, in a corps attack, the corps commander would be the force commander making the decision. However, the force field artillery commander makes recommendations to the force commander as to whether preparation fire should be fired and recommends a time length. The primary questions to be resolved in reaching a decision to fire or not to fire a preparation are:

(*a*) Will the effect gained offset the loss of surprise?

(*b*) Have a sufficient number of profitable targets been located?

(*c*) Are enough fire support resources available?

(*d*) What is the enemy reaction time?

(3) When preparation fire is fired, it is normally phased to permit successive attacks on certain types of targets. Phasing should permit early attack of hostile fire support means, intermediate attack of local reserves and command and control agencies, and late attack (just before jumpoff) of enemy forward elements. Neutralization of hostile fire support means and other critical targets is maintained throughout the preparation.

(4) The time length of the preparation fire is specified by the force commander, who bases his decision on recommendations by the force field artillery commander/FSCOORD. The time length of a field artillery preparation is based on previous combat experience, the number of targets, the amount of ammunition available, the amount of field artillery available, and the desires of maneuver commanders.

(5) When the time length of the field artillery fire has been announced, the field artillery commander can determine by use of a formula the number of targets that can be attacked by field artillery during the preparation fire. The factors included in the formula are as follows:

(*a*) *The number of targets to be scheduled.*

(*b*) *The planning time.* The planning time is the total time, in minutes, planned per target (time to shoot plus time to shift to another target). The amount of time required to fire on targets will vary. For planning purposes, an average time is selected.

(*c*) *The number of field artillery units available to fire.*

(*d*) *The method of attack.* The method of attack is the number of field artillery units that will fire on each target and is based on target analysis.

(6) An example problem is as follows:

Given: Time length of preparation fire—20 minutes.
Number of targets to be scheduled—unknown.
Planning time—4 minutes.
Number of field artillery units available five batteries.
Method of attack—one battery.

Find: The number of targets to be scheduled.

No of tgts to be scheduled = planning time X method of attack

Step 1: (formula) Time length = No. of field artillery units available

Step 2: $20 = \frac{(x)(4)(1)}{5}$

Step 3: $\frac{(x)(4)(1)}{5} = 20$

Step 4: $\frac{4x}{5} = 20$

Step 5: $4x = 100$ (5x20)

Step 6: $x = 25$ targets

Note 1: The answer above indicates the maximum number of targets that can be scheduled in the 20-minute preparation fire (considering the other elements given).

Note 2: The units used in "method of attack" and "number of units available" must be compatible; e.g., battalions must not be mixed with batteries in the formula.

Note 3: If the planner is using one battery as a unit (method of attack) and elects to attack a target with more than one battery, he must treat that target as a multiple target; e.g., if he plans to attack a target with three batteries, he will treat the target as three targets.

(7) If desirable, the formula may also be used to determine the time length of the preparation fire. When used for this purpose, another item, reserve time, is applied to provide for additional targets received after planning has started. Reserve time will vary, depending on the rate at

which new targets are received and developed at the fire direction center.

(8) An example problem is as follows:

Given: Time length of preparation fire—unknown.
Number of targets to be scheduled (on hand)—20.
Planning time—5 minutes.
Number of artillery units available—eight battalions.
Method of attack—two battalions.
Reserve time—1¼.

Find: The time length of the preparation fire.

No of tgts to be scheduled X planning time X method of attack

Step 1: Time length = $\frac{\text{No. of tgts to be scheduled}}{\text{No. of field artillery units available}} \times \text{planning time} \times \text{method of attack}$

Step 2: Time length = $\frac{(20)(5)(2)}{8}$

Step 3: Time length = $\frac{200}{8}$

Step 4: Time length = 25 minutes

Step 5: Apply the reserve time to the time length to provide for additional targets (¼ of 25 = 6.2 min).

Step 6: Add 6.2 minutes to the time length from step 4 (25 + 6.2 = 31.2 min).

Step 7: Round up 31.2 minutes to the next higher increment of planning time (5 min). Time length of preparation fire = 35 minutes.

(9) All the targets, the firing units to engage the targets, and the time sequences are included in a field artillery fire support table. The preparation fire may be initiated on call or at a specified time as determined by the supported force commander. The scheduled sequence of targets must not be so rigid that one or more of the firing units cannot depart from the schedule to attack lucrative targets of opportunity or on-call targets. Units attacking these targets will reenter the schedule at the current time, *not* the time at which they left the schedule. If requested to do so, the field artillery operations officer will arrange to engage those scheduled targets that were omitted during the preparation.

(10) Of necessity, detailed coordination is required not only during the planning phase but also during the execution phase. The fire support planner must monitor friendly maneuver progress during the preparation fire to insure that overrun targets are not attacked. Overrun targets should be deleted from the preparation fire.

c. Fire During the Attack. Fires during the attack are those fires delivered to assist the advance of the supported unit. They consist of fires between the lines of departure (LD) and the objective, fires on the objective, and fires beyond the objectives. Fires planned in support of the attack usually consist of targets on call and may include planned targets that have been attacked previously during the preparation fire.

(1) Fires short of the objective are planned to engage hostile forces, weapons, and observation posts and thereby assist the advance of the supported force. Normally, these fires are on call and are initiated by a forward observer.

(2) Fires on the objective are planned to destroy or neutralize resistance and thereby assist the final assault. Covering fire is used to protect assaulting troops when they are within range of enemy direct fire weapons. Both planned targets and targets of opportunity should be engaged in covering fire. Groups of targets, series of targets, and programs of targets listed in field artillery fire support tables and available on call are ideally suited to providing covering fire.

(3) Fires beyond the objective are planned to protect units during consolidation and reorganization to break up counterattacks, and to prevent the enemy from reinforcing or disengaging his forces or effecting resupply. These fires should be planned by the forward observer and should be considered priority fires.

(4) Neutralization of hostile observation posts, artillery, and automatic weapons is maintained throughout the attack.

(5) The fire planner must insure that the no fire line (NFL) is advanced commensurate with the progress of the attack, and that new locations are disseminated to all concerned.

10-7. Defensive Fire

Field artillery defensive fire is fire delivered by supporting units to assist and protect a unit engaged in a defensive action. Fires in support of defensive operations are planned to engage targets before and after the enemy forms for the attack, during the enemy attack, and in support of the counterattack.

a. Fires Delivered Before the Enemy Forms for the Attack. Fires delivered before the enemy forms for the attack include fires that will force

the enemy into early deployment and fires in support of security forces.

(1) Fires in support of a security force (covering force) are usually planned by the highest field artillery echelon with that force. Additional fire support from a general outpost (GOP) force and the main defensive force is planned to cover the withdrawal of the security force.

(2) Field artillery supporting a covering force or general outpost force usually fires initially from supplementary positions to prevent disclosing to the enemy the primary positions to be used to support the main battle area. Fires in support of the combat outpost (COP) are usually planned by field artillery with the main defensive force. The time of opening fire is decided by the force commander. Premature firing from the primary positions in the main battle area will expose field artillery to neutralization and may reveal the plans of the defending force.

b. Fires Delivered After the Enemy Forms for the Attack (Counterpreparation Fire).

(1) Counterpreparation fire is intense prearranged fire delivered when the imminence of the enemy attack is discovered. It is designed to break up his formations; disorganize his system of command. communications. and observation; decrease the effectiveness of his artillery preparations; and impair his offensive spirit.

(2) The planning for a counterpreparation should be initiated as early as possible. Counterpreparation fire is normally planned each time the force makes an extended halt. Before the commander announces his concept of fire support, the fire planner will normally select a time length for the counterpreparation fire and adjust it as necessary after the ime length is specified. Fires should provide for early and simultaneous attack of enemy forward elements. his indirect fire support means. and his OP's. Next, the enemy's command, communications, and reserves should be attacked while neutralization of his indirect fire support means is maintained. In order to provide for this simultaneous attack of targets in the counterpreparation, division and corps artillery will place emphasis on the enemy's indirect fire support means and OP's, while the direct support battalions place their emphasis on enemy forward elements and OP's. Both fire planning agencies will then schedule other appropriate targets for firing. (This does not preclude the direct support battalions from scheduling fires on indirect fire support means that may affect their supported unit's zone of action.) When the enemy is about to attack, his troops may be in forward positions, his artillery may have been moved forward to support his attack, and he may have stockpiled ammunition and supplies. These possibilities should be considered in planning the counterpreparation fire.

(3) Counterpreparation fire is fired on order of the force commander. The time of firing is critical. If it is fired too early, friendly field artillery locations may be revealed to the enemy. If it is fired too late, the desired effect may not be achieved. Although the force field artillery commander *does not* make the decisions as to when to fire the counterpreparation fire, he may be called on for a recommendation, and his units must be prepared to fire on short notice. Targets are assigned to firing units, and firing data are kept current. Instructions as to the number and type of rounds per target are given by the field artillery planning headquarters. All the information for counterpreparation fire is included in a field artillery fire support table to be fired on call.

(4) The method of computing the time length of counterpreparation fire and the number of targets to be scheduled is the same as that used for preparation fire (para 10-6).

c. Fires Delivered During the Enemy Attack.

(1) If the enemy is successful in launching his attack, fires are delivered to break up his attack and limit his penetration. Included in these fires are the final protective fire (FPF) of field artillery and mortars.

(2) FPF is an immediately available prearranged barrier of fire designed to impede the movement of the enemy across defensive lines or areas. Some of the characteristics of final protective fire are as follows:

(*a*) Field artillery FPF's are integrated with all the FPF's of the force, which include the FPF's of the machineguns and the FPF's of the supporting mortars. FPF is used only in the defense. Each field artillery cannon battery and 4.2-inch mortar platoon can be assigned one FPF.

(*b*) A field artillery FPF is represented on a map or firing chart by a linear plot as illustrated in figure 10-6. The FPF is identified by the abbreviated designation of the unit that will fire it. The width of the FPF depends on the type of unit assigned to fire it. A single FPF of the 4.2-inch mortar platoon is, under normal conditions, 200 meters wide. Final protective fires of the 105mm and 155mm howitzer batteries are 200 and 300 meters wide, respectively. The depth of a FPF is not fixed. If necessary, the shape, or pattern, may be varied to fit the tactical situation.

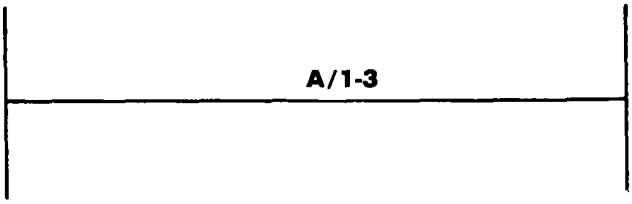


Figure 10–6. Symbol for final protective fire (FPF).

Because of the relatively slower rates of fire of the weapons, the 8-inch howitzer and the 175mm gun batteries are not normally assigned final protective fires.

(*c*) The final protective fires of the direct support field artillery are available to the supported brigade. The FPF of general support-reinforcing units *may* be allocated to committed brigades, when requested, by modifying the tactical mission of the affected field artillery unit. The brigade commander designates general locations for available FPF's or allocates final protective fires to the maneuver battalions. The maneuver battalion commander, in turn, designates general locations for FPF's or allocates FPF's to the maneuver companies. The company commander designates which maneuver platoon will have the FA FPF and which maneuver platoon(s) will have the mortar FPF(s). Designation of the precise locations of FPF's is the responsibility of the maneuver platoon leader(s) in whose sector the fire(s) falls. The coordinates of the center of the area and the width and attitude of the area are reported to the maneuver battalion and the direct support field artillery battalion.

(3) The field artillery forward observer has the following three responsibilities concerning the FPF assigned to the company with which he is working:

(*a*) To report the desired location of the FPF to his fire direction center.

(*b*) To adjust fire, by piece, onto the desired location (time, ammunition, and tactical situation permitting).

(*c*) To relay the call to fire the FPF to his fire direction center. The authority to call for a FPF is vested in the company commander and/or platoon leader in whose sector the final protective fire is located.

(4) When a field artillery unit is assigned a final protective fire, *the unit will be laid on FPF data when not engaged in other firing.* Several rounds of ammunition per weapon, with the proper charge and fuze settings, will be set aside for firing the final protective fire. The final protective fire is fired at the *maximum rate of fire possible* until it is ordered lifted by the supported unit; until it has been fired the prescribed length of time; or until all ammunition is exhausted, whichever occurs first.

d. Fires Delivered in Support of the Counterattack.

(1) Time permitting, a maneuver force usually prepares multiple counterattack plans to meet several enemy attack capabilities.

(2) Field artillery fire planning to support a counterattack must be detailed and must be coordinated with the maneuver elements to insure adequate support. A separate field artillery fire support appendix should be prepared for each counterattack plan.

(3) The fire planning for a counterattack must provide for support of the counterattacking force; it must provide also for stopping or blunting the nose of the penetration, destroying the enemy within the penetrated area, and sealing off the base of the penetrated area to prevent reinforcement by the enemy.

(4) A division counterattack plan should provide for accomplishment of the required tasks ((2) above) in the following manner:

(*a*) The nose of the penetration is blunted or stopped with a combination of firepower and maneuver. The direct support battalion in support of the committed brigade will plan fires designed to stop the penetration. These fires are usually in close proximity to the maneuver unit's blocking positions.

(*b*) The planning and execution of field artillery fire support for the counterattacking force is accomplished by the field artillery unit with the tactical mission of direct support of the counterattacking force. The fire support may include a preparation fire or a series of targets and covering fires. The FSCOORD will make recommendations as to appropriate fire support coordination measures to be employed; e.g., a fire coordination line (FCL). The direct support field artillery headquarters will insure that plans include fires on enemy targets within the penetrated area.

(*c*) Planning for the sealing off of the base of the penetrated area and the delivery of fires for destruction of the enemy is usually accomplished by the division artillery fire direction center. In addition, division artillery must insure that the planning in the other areas ((*a*) and (*b*) above) is complete and adequate.

e. Fires Delivered in Support of Defensive Operations. Fires are planned in the following three general areas to support defensive operations:

(1) Fires are planned in front of friendly positions on likely avenues of approach and on identifiable terrain features. Fire in front of the forward edge of the battle area (FEBA) is planned to engage the enemy as early as possible in order to inflict casualties, delay his advance, disrupt his organization, and destroy the integrity of his attacking force. If the fire in front of the FEBA fails to halt the attacking enemy, the final protective fires are delivered to destroy him during his assault.

(2) Fires are planned *on top of friendly positions.* If the enemy penetrates the defenses and reaches the positions, fire can be called for immediately.

(3) Fires are planned *behind the FEBA and within the battle area* to give depth to the defense, to limit penetrations, to support the counterattacks of the supported unit, and to support the withdrawal of friendly troops.

10–8. Other Types of Fire Support

a. Harassing and Interdiction Fires. Harassing and interdiction (H&I) fires are usually planned by the division and corps artilleries and are prearranged as much as possible. They are based on studies of maps, the terrain, and the road nets available to the enemy and on all available target intelligence. Harassing fire is planned on known enemy positions to inflict losses, to curtail movement, and, in general, to disturb the enemy and keep him off balance. Targets suitable for harassing fire are known hostile batteries, installations, assembly areas, observation posts, communications centers, command posts, and leading elements. Interdiction fire is planned on critical areas to deny the enemy free use of these areas. Targets suitable for interdiction fire are harbors, road junctions, bridges, and crossroads. H&I fires should be scheduled at irregular intervals to avoid giving the enemy a predictable pattern of fire. Deception must be maintained as to the amount of field artillery and its location. Although H&I fires are normally planned at a higher field artillery headquarters, direct support battalions normally participate in their firing.

b. Counterbattery Fire. Counterbattery fire is fire delivered for the purpose of destroying or neutralizing enemy indirect fire weapon systems. Planned targets for counterbattery fire are included in a counterbattery program. The counterbattery program may be divided into countermortar, countercannon, counterrocket, and countermissile programs. All counterbattery targets are sent to division artillery and to corps artillery, where the counterbattery programs for the subordinate units are prepared. Counterbattery targets should be given high priority in scheduling preparation and counterpreparation fires. The counterbattery program is included in a field artillery fire support table.

c. Other Fires

(1) It may be necessary to categorize and plan other types of fires, such as counterflak or counterobservation post fire. Targets included in these types of fires are included in an appropriate program of targets (para 10–3).

(2) Counterflak fire may be planned and fired by field artillery units upon the request of tactical ground or air commanders for the specific purpose of protecting aircraft from ground fire during the execution of close air support, air reconnaissance missions, or army aviation operations. Counterflak fire must be prearranged to insure engagement of all known and suspect enemy air defense weapons which could endanger friendly aircraft enroute to, or departing from, the target or objective area. No standard or stereotyped plan can be used since a plan must meet the particular counterflak situation for a specific mission. If it is not feasible to destroy the enemy air defense capability in the area of concern, it may be possible to silence the enemy's weapons by attacking the gun crews or screening friendly aircraft with smoke. In conducting flak suppression fires, it may be desirable to subdivide the counterflak effort by area, zone or specific mission, however, care must be taken not to obscure the target or objective area, or to endanger friendly aircraft with friendly field artillery fires. Air Force flak intelligence agencies and other agencies furnish the target data to field artillery commanders and may include automatic weapons as well as antiaircraft weapons and systems. Requests for, and coordination of counterflak fires are processed through fire support channels and are implemented at the field artillery fire direction center upon the request of forward air controllers, fire support officers, or other personnel as necessary.

10–9. Effect Desired

Fires are categorized as to the effect desired on a target; i.e., destruction, neutralization, harassing, illumination, and marking fires. The definitions of these terms are given in appendix B or in AR 310–25.

Section IV. FIRE SUPPORT ANNEX

10-10. Fire Planning Channels for Fire Support

a. Fire Planning Levels. Fire support planning is continuous and concurrent. It takes place at all levels from the forward observer through the highest echelon. Close coordination between field artillerymen (fire support coordinators) and supported commanders is necessary at all levels. Fire planning channels are shown in figures 10-7 through 10-10.

b. Commander's Concept of Operation. Planning is initiated upon receipt of the force commander's decision and concept of operations, which includes the scheme of maneuver and the plan of fire support. The commander's concept of operations, which may be written, verbal or graphic, outlines the overall picture of the intended operation.

c. Company Level. The forward observers available (field artillery, 4.2-inch mortar platoon, and 81-mm mortar platoon) are briefed by the maneuver company commander concerning the company's mission, plan of maneuver, and plan of fire support. Using data obtained at this briefing as a basis, the forward observers plan fires. The field artillery forward observer submits his target list for field artillery fires to the FSCOORD with the maneuver battalion. The 4.2-inch mortar platoon forward observer submits his list to the 4.2-inch mortar platoon fire direction center, which consolidates the target lists from the three rifle companies and forwards a consolidated list of targets for mortar fires to the fire support officer at the maneuver battalion headquarters. The target list of the 81-mm mortar observer normally is retained at company level. *Coordination at company level* (company commander and all observers) *is of prime importance.* The coordination of fire support at company level is the *responsibility* of the company commander. He may personally perform all actions associated with this responsibility, or he may designate an individual to act in his behalf. Proper coordination at company level (fig 10-7) increases fire planning efficiency at all higher levels.

d. Maneuver Battalion Level. The field artillery fire support officer (FSCOORD) with the maneuver battalion is responsible for preparing the complete list of targets (fire support requirements) to support the maneuver battalion. He combines the targets of the field artillery forward observers working under him, appropriate targets from the target list of the heavy mortar platoon, and the targets developed by the maneuver battalion commander or members of his staff. The latter targets may include targets beyond the company objectives and those emphasized by the battalion commander in his concept of operations. He checks the 4.2-inch mortar platoon targets and the forward observers' target lists against each other and resolves any duplication. The FSCOORD may include 4.2-inch mortar targets in his artillery target list when additional fires are needed. After the duplications have been resolved and the target lists have been consolidated, the forward observers are informed of the approved targets and of any changes to their lists. The FSCOORD may assign target numbers himself, or he may allocate portions of his block of numbers to his forward observers. After the target lists are consolidated and duplications resolved, the consolidated target list is submitted to the maneuver battalion commander for approval. Upon approval, the consolidated target list is sent to the direct support (DS) field artillery battalion fire direction center for action and to the brigade FSCC for information and necessary coordination to include airspace coordination. After consolidation of targets and assignment of firing units by the DS battalion S3, the target list is returned to the maneuver battalion fire support officer. A fire support annex is then prepared by the maneuver battalion fire support officer and, upon approval by the maneuver battalion commander, is sent to the brigade FSCC and to the DS FA battalion FDC. An operations order is normally not written at maneuver battalion level; however, should one be written, the target list is returned to the maneuver battalion fire support officer after consolidation of targets and assignment of firing units by the DS battalion S3. A fire support annex is then prepared by the maneuver battalion fire support officer, and upon approval by the maneuver battalion commander is sent to the brigade FSCC and DS battalion FDC. When an operations order is not written at the maneuver battalion level, the battalion requirements for fire support are incorporated in the brigade fire support annex (*e* below).

e. Direct Support Field Artillery Battalion Level.

(1) The focal point for planning field artillery support at brigade level (fig 10-8) is the direct support field artillery battalion S2/S3 oper-

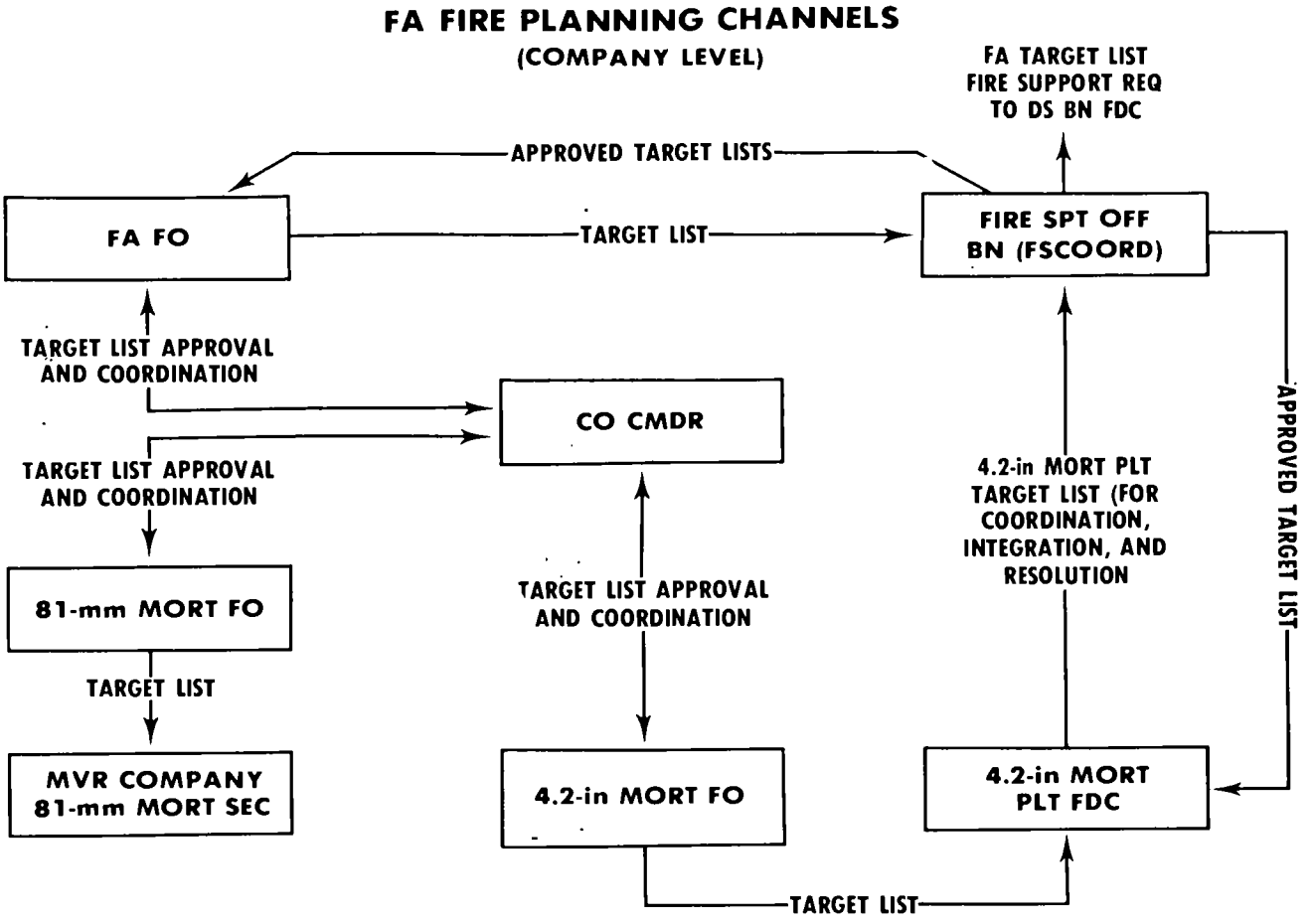


Figure 10–7. Fire planning channels—company level.

ations center. The field artillery battalion S3 consolidates the planned use of available and immediately responsive field artillery. He and the battalion S2 receive and analyze all target information and guidance from several sources to include the brigade fire support officer. Target information is also received directly from division artillery, adjacent units, moving target locator radar, the organic countermortar radar unit, and other field artillery target acquisition agencies. The S3 of the direct support battalion prepares the brigade's field artillery fire support appendix and forwards it to the brigade commander for approval and signature. An information copy of the approved appendix is sent to division artillery. Request for additional fires are also forwarded to division artillery.

(2) The direct support field artillery battalion may be requested by brigade to plan the fires of the supported unit's battalion mortars. In this case, each heavy mortar platoon may be allocated targets in the field artillery fire support table.

(3) When approved, the brigade's field artillery fire support appendix is distributed to the firing batteries, to all fire support officers, to division artillery, and to reinforcing and adjacent field artillery units. This distribution confirms the attack of targets which have been requested and which have been sent to the interested parties for information, coordination clearances, computation of firing data and requests for additional fires. The fire support officers at maneuver battalion level notify the forward observers who advise the maneuver company commander of the fires planned in their sectors.

f. Division Artillery Level.

(1) At division artillery level (fig 10–9), the S3 prepares the field artillery fire support appendix to support the division operations based on the division commander's concept of operations and his concept of fire support.

(2) The division's field artillery fire support appendix is developed from the requests of subordinate field artillery units and corps artillery and from the field artillery support requirements of

FIRE PLANNING CHANNELS
(COMPANY AND BRIGADE LEVEL)

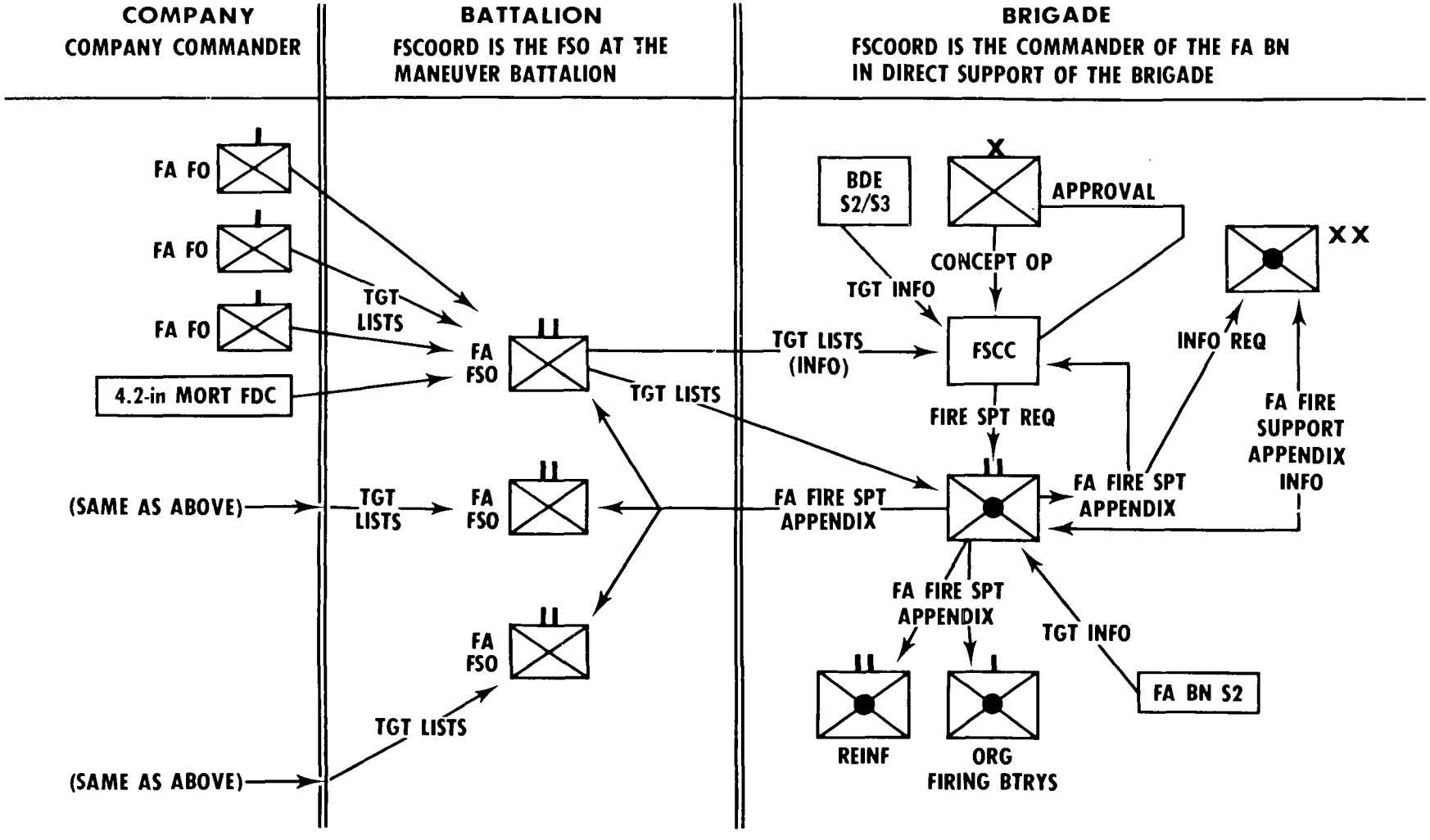


Figure 10–8. Fire planning channels—brigade level.

FIRE PLANNING CHANNELS
(DIVISION ARTILLERY LEVEL)

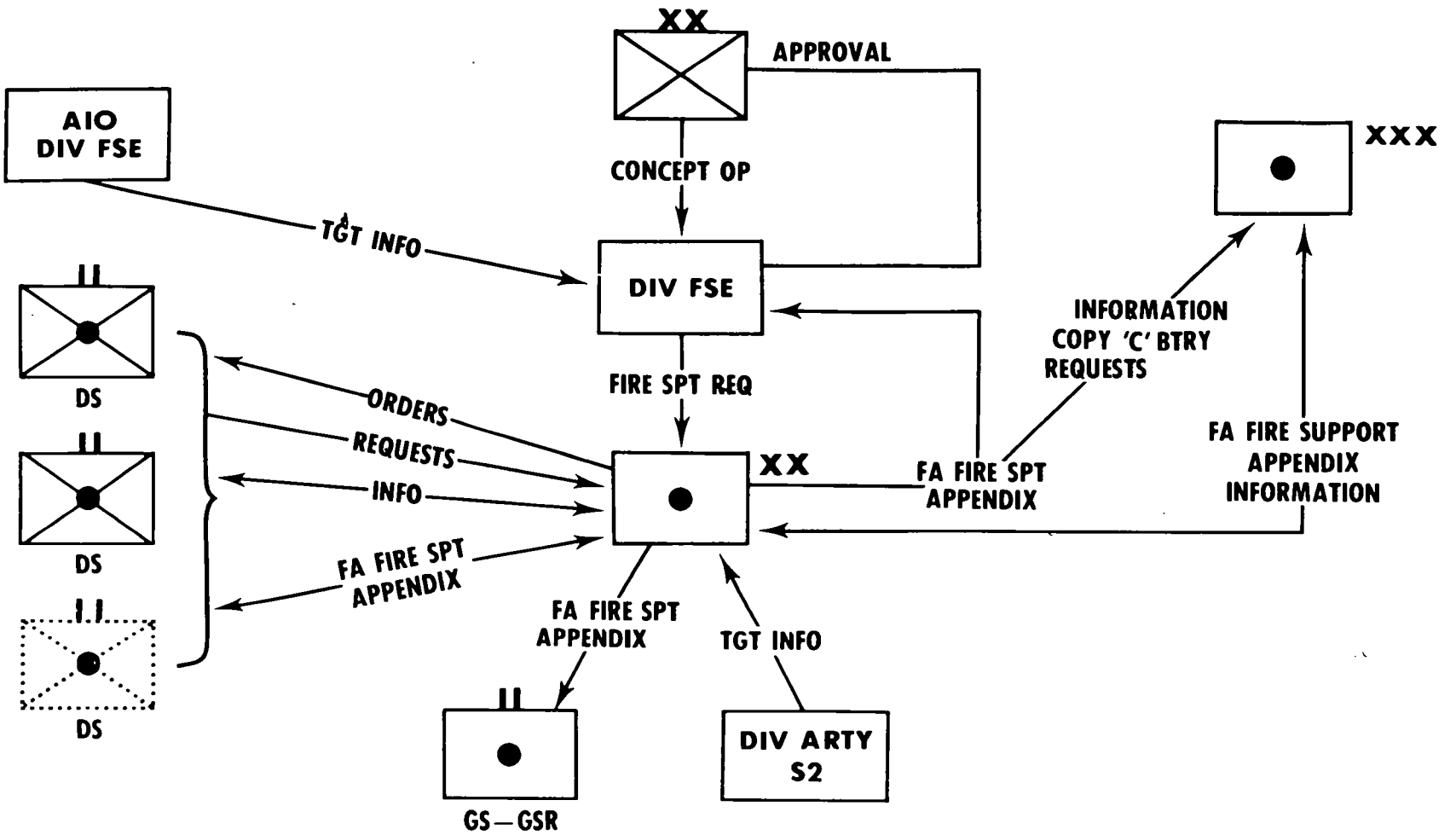


Figure 10–9. Fire planning channels for field artillery support—division artillery.

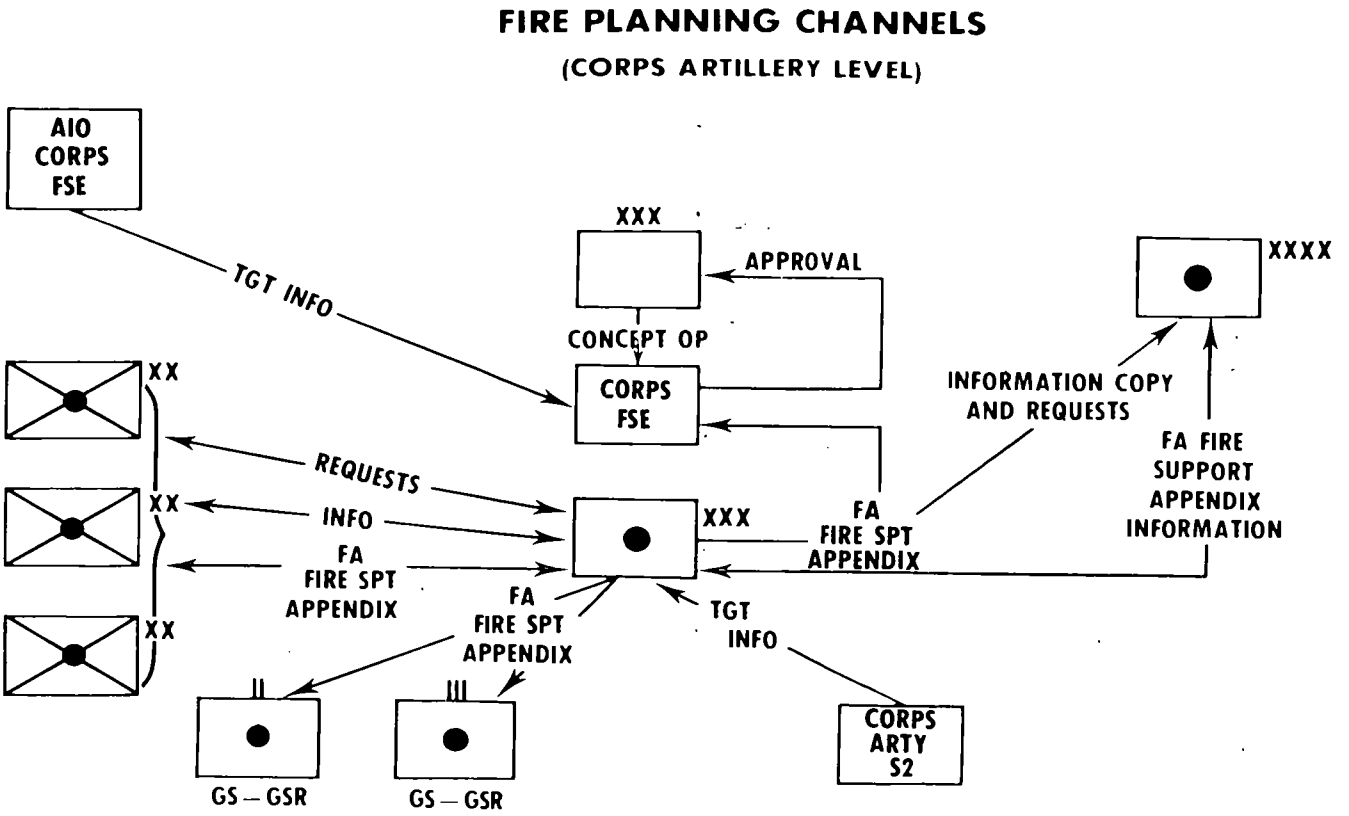


Figure 10–10. Fire planning channels for field artillery support—corps artillery.

the division. The objective of the division artillery planning is coordinated field artillery fire support for the entire division area.

(3) Preparation of the division's field artillery fire support appendix is initiated by planning fires for the division general support and general support-reinforcing field artillery, and for other field artillery reinforcing the division artillery. These fires are placed on targets requested by, or beyond the range of, direct support field artillery and on targets of interest to the division as a whole. The fires of direct support field artillery are augmented when necessary by division artillery assets and are included in the field artillery fire support appendix of the division fire support annex.

(4) Coordination is effected with the lower echelons of the force if fires are planned within the zones of responsibility of the lower echelons or if the operations of the lower echelons are affected.

(5) Targets which are capable of even limited interference with the division scheme of maneuver and which may affect the brigades are sent to the S2 of the direct support field artillery battalion concerned for consideration for attack at that level.

(6) All counterbattery targets are sent to division artillery and to corps artillery. Division artillery and corps artillery prepare the counterbattery programs for their subordinate units.

(7) Division artillery checks the field artillery fire support appendixes submitted by the direct support artillery to eliminate duplications and resolve conflicts, and to insure that in conjunction with the division's field artillery fire support appendix, the requisite degree of field artillery fire support is being provided. The fire support appendix at division artillery will normally provide for counterflak fires, harassing and interdiction fires, preparation fires, counterpreparation fires, and counterbattery fires.

(8) Upon completion, the division's field artillery fire support appendix is sent to the fire support element of the division tactical operations center where the fires are compared with those planned for other fire support means. Airspace coordination is also conducted at this time. It is then presented to the division commander or his designated representative for approval and signature. Copies are then sent to reinforcing field artillery units, corps artillery, adjacent division artilleries, and subordinate field artillery units.

g. Corps Artillery Level.

(1) Preparation of the field artillery fire support appendix (fig 10–10) for corps starts with planned fires in the corps zone on hostile artillery locations, targets beyond the range of division artillery, and targets of importance to the corps as a whole.

(2) Field artillery fires requested by lower echelons are included in the corps field artillery fire support appendix.

(3) The corps artillery fire support appendix is modified to meet changes in the situation. The appendix will normally include harassing and interdiction fires, preparation fires, and various other programs of targets to include counterbattery fires.

(4) Coordination is effected with the lower echelons of the force if fires are planned within the zones of responsibility of the lower echelons or if the operations of the lower echelons are affected.

h. Field Army Level. The army field artillery officer is responsible for planning the fire support provided by field artillery directly under army control. The army field artillery support is coordinated with the other types of fire support, as required.

10–11. Concurrent and Continuous Fire Support Planning

a. Fire support planning at all levels is conducted concurrently and continuously. It does not cease when a formal fire support annex is published and disseminated. Additions, deletions, and changes continually flow through fire planning channels.

b. Development of the fire support plan at one echelon should not be delayed pending receipt of requirements for fire support from another echelon. The continuous flow of data and continuous coordination permit plans for fire support to be developed concurrently at all echelons. It is only by the use of these techniques that fire support can be timely.

Section V. FIELD ARTILLERY FIRE SUPPORT APPENDIX

10–12. General

a. The field artillery fire support appendix is a tactical plan for coordinating and employing the fires of all supporting field artillery available. The field artillery fire support appendix enables the field artillery commander to—

(1) Define targets which are assigned and those which can be assigned to units under his authority or to units whose fires are placed at his disposal.

(2) Allocate targets to his units.

b. When the appendix for field artillery fire support is approved, it is identified as an appendix to the fire support annex; e.g., Appendix 2 (Field Artillery Fire Support) to Annex D (Fire Support to OPORD 16.

c. The field artillery fire support appendix consists of a written portion, a target list, a target overlay, and one or more fire support tables. The target list, target overlay, and field artillery fire support tables are identified as tabs to the field artillery fire support appendix. An example of a field artillery fire support appendix is shown in appendix G.

10–13. Written Portion of the Field Artillery Fire Support Appendix

a. The written portion of the field artillery fire support appendix is the basic document. It has the standard heading and ending similar to the operation order.

b. The written portion includes that information which is necessary to the understanding of the field artillery fire support appendix and any other special information on the employment of field artillery fire in support of the operation or in support of any phase of the operation to which the fire support appendix will apply. Examples of this information are—

(1) The scheme of maneuver or plan of defense of the supported unit.

(2) The priority of fires.

(3) Requests to higher headquarters for additional fire support.

(4) Requests for special missions (e.g., destruction missions) and requests for clearance for fires outside the zone of the supported unit. Action to obtain clearance for fires outside the zone of the supported unit should be accomplished at the earliest practicable time; the S3 should not wait until a formal fire support appendix is prepared.

(5) Any pertinent information concerning the employment of the support unit's organic weapons (e.g., mortars) or any other firepower available to the force (e.g., tanks in an indirect fire role).

(6) Methods of attack of scheduled or on-call targets to include the type of ammunition and fuze required if other than SOP or if special emphasis is required.

c. The heading indicates the maneuver unit supported. The ending of the original copy bears the signature of the commander of the supported force; all other copies are authenticated by the supported force G3 (S3).

d. There is no prescribed format for the information contained in the body of the written portion.

10-14. Target List

The target list (tab A, app G) is a compilation of targeting data planned to support an operation. The target list contains the following data, as appropriate, for each target listed:

a. Target Number. Each target is given a target number.

b. Description. The target may comprise gun sites, dugouts, assembly areas, batteries, observation posts, personnel, command posts, etc. It may be in the open, sheltered, or underground.

c. Location. Targets are normally located by grid coordinates to the nearest 10 meters. The reference system used must be specified at the top of the target list.

d. Altitude. The altitude (height) of the target is always given in meters.

e. Size. The target may be a—

(1) Pinpoint or comparable target. No dimension is given.

(2) Linear or comparable target. The length is given.

(3) Rectangular target. The length and width are given.

(4) Circular target. The center point and radius are given.

f. Attitude. The attitude of the target is expressed in mils of angular deviation from grid north unless otherwise specified and must be given for—

(1) A linear target.

(2) A rectangular target. The attitude of the greater dimension is given.

(3) Deliberate smoke missions.

g. Source and/or Accuracy (Optional). If required, the source and/or accuracy of the information concerning the location of the target is specified.

h. Remarks. Special considerations for the target and further amplification of the description of the target may be included in the remarks column.

Notes: 1. If the target is measured in units other than meters and mils, the reference system must be specified at the top of the target list.

2. The target list includes work columns (right edge) that are used to indicate the targets to be included in a specific field artillery fire support table.

10-15. Target Overlay

a. The target overlay (tab B, app G) supplements and confirms the target list. It is a graphical display of targeting data.

b. Targets are identified on the target overlay by symbols and target numbers. The symbols should agree with those in figures 10-1 through 10-6 and in STANAG 2019 and FM 21-30. Since reproduction of the overlay may cause inaccuracies, the locations given in the target list are considered to be more accurate than those shown on the overlay, and should therefore be used in the technical fire direction.

c. A group of targets (para 10-3*d*) is represented by a line encircling the targets concerned and is identified by a letter/number combination.

d. A series of targets (para 10-3*e*) is represented by a line encircling the targets or groups of targets concerned and is identified by a nickname or code word.

e. When time and resources allow, the target overlay is replaced by a map on which targets are plotted directly.

10-16. Field Artillery Fire Support Table

a. The field artillery fire support table (tabs C and D, app G) shows the targets assigned to firing units. In addition, it specifies—

(1) The starting time and duration of fire on each scheduled target.

(2) The total expenditure of ammunition by each firing unit on each target.

(3) The type of ammunition to be fired on each target.

(4) On-call targets.

(5) The time for opening fire. Targets included in the fire support table may be fired on order, at a predetermined time, or when a specific event occurs.

(6) Any special instructions.

b. For each phase of an operation, the following may be prepared:

(1) A separate field artillery fire support table for each of the following categories of targets and fires:

(*a*) Groups of targets.
(*b*) Series of targets.
(*c*) Programs of targets.
(*d*) Preparation fire.
(e) Counterpreparation fire.
(*f*) H&I fires.
(*g*) Illumination fire.
(*h*) On-call targets.

(2) Instructions for other types of fires.

c. The items of information required in a field artillery fire support table are amplified in (1) through (7) below.

(1) For each target to be fired, except targets to be engaged by use of the time-on-target (TOT) technique—

(*a*) Indicate, by use of a horizontal line, the starting time for the firing elements and duration of fire. The sustained rate of fire is the basis for computing the length of the line as well as the shift time (interval between lines).

(*b*) Enter the target number above the line.

(*c*) Enter the number of rounds of ammunition to be fired by the unit below the line or rate. (Rate to be expressed as the number of rounds per weapon per minute, prefixed by the word "Rate" or the letter "R").

(*d*) Enter additional remarks, as appropriate, in the remarks column.

(2) For each target to be engaged by use of the TOT technique, enter in the field artillery fire support table the target number, the number of rounds to be fired, and the time at which the target is to be engaged.

For example:

—12	—10	—8	Remarks
AF2021			
24(c)			(c) TOT H–12

(3) Targets shown in the field artillery fire support table may be scheduled or on call.

(4) Targets assigned to a firing unit may be fired singly, as part of a series of targets or as part of a group of targets. Each target in a group of targets is assigned to a firing unit in such a manner as to permit simultaneous engagement of all targets in the group. Simultaneous engagement does not mean that the time-on-target technique must be used.

(5) The field artillery commander concerned determines the smallest field artillery unit to be shown in the field artillery fire support table. The size of the smallest unit to be shown depends on the level at which the table is prepared. When the artillery fire of non-US units is included in the field artillery fire support table, consideration is given to particular national characteristics in regard to organization and procedure.

(6) Unless otherwise indicated in the field artillery fire support table, targets are usually engaged with fuze quick, high-explosive ammunition. If a target is to be engaged wholly or partly with any other type of ammunition, such as smoke shells or proximity fuzed shells, the type of ammunition must be specified in the remarks column.

(7) If necessary, instructions for registration and/or adjustment are specified in the written portion of the field artillery fire support appendix, if they are not already shown in an operation order or fire support annex. When fire is to be directed in the proximity of friendly troops, the position of the friendly troops will be shown on the target overlay.

10–17. Field Artillery Fire Support Appendix Construction

The procedure for constructing a field artillery fire support appendix is given in *a* through *g* below. The procedure applies to fire direction centers at all echelons.

a. Plot the firing units and their range and traverse capabilities on an overlay to be affixed to the fire planning map.

b. List the targets received from the planning sources on the target list and annotate the work columns as to the required technique of attack (e.g., preparation, counterpreparation, groups, series, programs, etc.).

c. Plot targets and designate other targets as appropriate.

d. Resolve any duplications of targets.

e. Determine firing unit(s) to attack each target.

f. Prepare a field artillery fire support table for those targets and fires to be fired in accordance with a time schedule; e.g., preparation fire, counterpreparation fire, series of targets, programs of targets, and H&I fires. Also, prepare a field artillery fire support table for groups of targets.

g. Prepare the written portion.

10–18. Artillery Quick Fire Support Plan

a. An artillery quick fire support plan provides the necessary information to enable—

(1) The originator to plan fires and to transmit to all concerned (by radiotelephone if necessary) the details of the artillery quick fire support plan.

(2) Fire direction centers and command posts to execute the fire support plan.

b. The format of an artillery quick fire support plan conforms, as far as possible, to the format of a field artillery fire support table.

c. The artillery quick fire support table includes —

(1) Identification of the originator and the supported unit (by unit designation or by nickname), and H-Hour.

(2) The target number and grid coordinates and description of each target to be engaged.

(3) Details for the engagement of targets to include—

(*a*) Organization or formation and firing unit.

(*b*) The starting time and duration of fire on each scheduled target.

(*c*) The total expenditure of ammunition by each firing unit and the type of ammunition to be fired on each target.

(*d*) On-call targets.

(*e*) Special instructions.

d. The artillery quick fire support plan is designed to be used by the fire support officer at maneuver battalion/brigade level for rapid fire planning in unexpected situations; e.g., when the maneuver battalion (brigade) must make a quick attack or counterattack. Using the targets reported by his forward observers and by the maneuver battalion, the fire support officer compiles a list of field artillery targets and transmits the target data to the direct support battalion fire direction center. The fire direction center arranges the targets to be scheduled and those to be placed on call in the artillery quick fire support table and transmits the information to the fire support officer, who enters the data in the appropriate portion of his artillery quick fire support plan.

e. The artillery quick fire support plan may also be used by the fire support officer with the maneuver battalion to transmit to his forward observers, who advises the maneuver company commander of the scheduled and on-call targets.

f. An example of an artillery quick fire support plan is in appendix L.

Section VI. FIRE DIRECTION

10–19. General

a. Tactical Fire Direction. Tactical fire direction is the exercise of tactical command of one or more units in the selection of targets, the designation of units to fire, and the allocation of ammunition for each mission.

b. Technical Fire Direction. Technical fire direction is the conversion of calls for fire to appropriate firing data and fire commands to the weapons.

c. Objectives of Fire Direction. The objectives of fire direction are to insure—

(1) Continuous, responsive, safe, and accurate field artillery fire support under all conditions of weather, visibility, and terrain.

(2) Sufficient flexibility for prompt and accurate massing of fires.

(3) Retention of the capability for distribution of fires on numerous targets.

(4) Control of field artillery fire through orders, policies, and priorities.

(5) Coordination and integration of field artillery fires with the fires of other fire support means.

10–20. Field Artillery Fire Direction Center

a. The fire direction center (FDC), consisting of gunnery, operations, and communication personnel and equipment, is the element of the field artillery headquarters through which the commander exercises fire direction and fire control. The personnel and equipment to accomplish fire direction and fire control are authorized by tables of organization and equipment (TOE).

b. At division level and above, the fire direction center controls and directs the fires of the units over which it exercises command and control. Firing data are not usually prepared. The S3 or his representative makes the decision to fire, pre-

scribes the method of attack, specifies the amount of ammunition to be fired on each target, and alerts the selected field artillery units.

c. The battalion fire direction center converts targets developed by the S2, fire missions from higher and supported force commanders, and calls for fire into appropriate fire commands; it then transmits the commands to the batteries. For some special ammunition missions, provisions may be made whereby the division artillery/battalion fire direction center may only monitor the calls for fire which are transmitted directly from the FSCC/FSE to the battery fire direction center. In some units (e.g., SERGEANT and PERSHING), there is no battalion fire direction center as such, since only the batteries have the capability to compute firing data. For the specific duties of FDC personnel, see chapter 18, FM 6–40.

d. Detailed doctrine and techniques of field artillery cannon gunnery are discussed in FM 6–40. Gunnery techniques for missile systems are discussed in the field manuals pertaining to each individual system.

Section VII. SMOKE OPERATIONS

10–21. General

Smoke operations vary from an obscuring smoke mission fired on an enemy observation post by a field artillery battery to a large-scale smoke operation involving field artillery, chemical smoke generator units, Army aviation, and tactical air force units in support of a river crossing or an amphibious assault. A minimal degree of planning is required for a smoke mission on a target of opportunity. Detailed planning is required for multiple scheduled or on-call smoke missions. Coordination must insure that smoke operations do not adversely affect adjacent units.

10–22. Characteristics and Types of Smoke

a. General. Smoke is employed in combat to reduce the effectiveness of enemy visual observation. Visual observation is reduced by projecting smoke on enemy observation points, on friendly units and installations, and between enemy observation points and friendly units and installations. Some types of smoke are used for signaling purposes.

b. Characteristics of Smoke. The characteristics of smoke produced by mechanical smoke generators and smoke pots (FM 3–50) are different from those of smoke produced by bursting-type ammunition. Smoke from white phosphorus (WP) ammunition rises 2 or 3 seconds after the burst and, under some conditions, may form a mushroom-shaped pillar. The pillar collapses when it cools, and the smoke may merge with smoke from other bursts to produce a cloud formation. Plasticized white phosporus (PWP) burns slower than does white phosphorus and produces smoke with less pillaring.

c. Types of Smoke.

(1) Screening smoke. White smoke is generally used as screening smoke since this color produces the maximum obscuring effect and reduces the effectiveness of observed or aimed fires. The tactical and logistical situations, including deception plans, greatly influence the type of smoke screen to be used (fig 10–11). Smoke can be employed to produce a smoke blanket, a smoke haze, a smoke curtain, or obscuring smoke.

(*a*) *Smoke blanket*—A dense smoke concentration established over a friendly area to prevent enemy visual observation and enemy visual precision bombing. Use of a smoke blanket may restrict movement and activity within the screen, thus hampering operations of friendly troops.

(*b*) *Smoke haze*—A light smoke concentration established over a friendly area to reduce enemy visual observation during daylight or moonlight. Use of a smoke haze allows movement and activity within the screen, thus allowing near normal operations. Visibility in a smoke haze is normally from 135 to 180 meters.

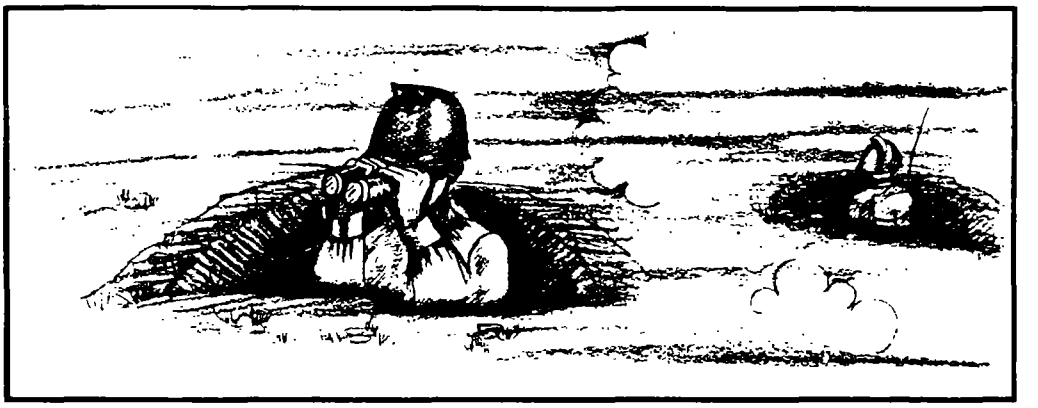
(*c*) *Smoke curtain*—A vertical smoke-screen established between enemy observation points and friendly units. Smoke curtains are used mainly in the forward edge of the battle area to obscure or restrict enemy ground observation of friendly positions and activities.

(*d*) *Obscuring smoke*—Concentrated smoke placed directly on enemy positions to obscure enemy visual observation into friendly territory. Obscuring smoke is delivered by ground or air means.

(2) *Signaling smoke.* Signaling smoke is available in several colors (red, green, violet, white, and yellow) and can be used to—

A. **SMOKE BLANKET**prevents enemy oeriol visuol observotion

B. **SMOKE HAZE** reduces enemy visuol observotion



C. **SMOKE CURTAIN** prevents enemy ground visual abservatian

D. **OBSCURING SMOKE** denies enemy ground visual observation

Figure 10–11. Types of smokescreens.

(*a*) Mark enemy or friendly positions by smoke emission on the ground.

(*b*) Transmit specific messages by prearranged color codes, for example:

1. Red—this position under attack.

2. Green—friendly patrol approaching position.

3. Yellow—lift fires.

10–23. Command Responsibility

The maneuver commander for whom the smoke operation is planned is responsible for the overall operation. He is responsible for the coordination of the smoke operations with all units participating in or affected by the operation. If the effects of a smoke operation are expected to transcend a boundary, coordination must be effected with the unit concerned and notification must be given to higher headquarters.

10–24. Staff Responsibility

a. The G3 (S3) is responsible for integrating the smoke operation with the plan of maneuver.

b. The chemical staff officer has primary responsibility for planning smoke blankets, haze, and curtains and insuring execution of the missions by chemical smoke generator units. He provides technical advice and assistance to the FSCOORD, the G3 (S3) air, and the Army aviation liaison officer in the airspace coordination element (ACE) for smoke operations involving field artillery, tactical air force, and Army aviation units, respectively. For large-scale smoke operations, he prepares the smoke support annex to the operations order. Chapter 4, FM 3–50, contains information on equipment and munitions, types of smoke screens, and effects of weather and terrain on smoke operations.

c. The FSCOORD is responsible for the coordination of all fire support on surface targets. He—

(1) Incorporates in the fire support annex appropriate orders and requests for smoke operations executed by fire support agencies.

(2) Insures that smoke operations are included in the appropriate support appendixes.

(3) Coordinates all smoke operations by supporting fire support agencies with the chemical staff officer.

d. The G3 (S3) air is responsible for planning and processing smoke operations to be conducted by supporting tactical air force units and for insuring execution of the operations.

e. The Army aviation officer is responsible for planning and processing smoke operations to be conducted by supporting Army aviation units and for insuring execution of the operations.

10–25. Planning Smoke Operations

a. Requests for smoke operations are processed through command or FSE/FSCC channels to the echelon which has approval authority.

b. The requests are analyzed by the various staff elements concerned. If a request involves smoke operations behind the FEBA (smoke blanket or haze), the chemical staff officer develops the plan and, after coordination with the other staff elements concerned, submits his recommendations to the G3 (S3). If a request involves operations on or forward of the FEBA, the capabilities of the various organic and supporting smoke-capable units are analyzed by the appropriate staff sections with the technical assistance of the chemical staff officer.

c. The following recommendations are then made to the commander:

(1) Types of smoke missions.

(2) Locations of areas to be screened.

(3) Time to initiate smoke missions.

(4) Duration of smoke missions.

(5) Smoke generator and/or delivery units to be employed.

d. Upon approval of the plan by the commander and when required, the chemical staff officer prepares the smoke support annex to the operations order. The FSCOORD includes appropriate orders and requests for smoke operations in the fire support annex.

e. The G3 (S3) air includes in the air fire support appendix those targets to be smoked by air delivery means.

f. The naval gunfire representative is responsible for planning and processing smoke missions to be provided by naval means.

g. The supporting field artillery fire direction center includes in the field artillery fire support appendix those targets to be smoked by field artillery. Targets or areas to be smoked are included in the target list. Smoke targets to be fired according to a time sequence are assigned to field artillery units and are placed in an artillery fire support table. Smoke targets may be included in groups or series of targets. Appropriate instructions for field artillery smoke operations are placed in the written portion of the appendix.

h. In the target list, the center of a smoke tar-

get is normally located by grid coordinates to the nearest 10 meters.

(1) No dimensions are given for pinpoint targets.

(2) The length and attitude are given for linear targets.

(3) The length, width, and attitude are given for rectangular targets.

(4) The radius is given for circular targets.

i. Smoke targets are depicted on the target overlay in the same manner as other targets.

j. The starting time and duration of fire for a planned smoke target are indicated by a horizontal line in the field artillery fire support table. Two factors are involved in field artillery smoke missions which are not involved in the engagement of other planned targets.

(1) About 8 minutes are required to adjust fire on the target and under ideal conditions, about 1 minute is required to establish the smokescreen.

(2) Smoke must be adjusted on the target before the smokescreen can be established.

k. The fire planner adds the 1 minute required to establish a smokescreen to the time length of the horizontal line; e.g., if a commander orders smoke on a target from H–10 to H–5, the horizontal line will extend from H–11 to H–5.

l. The fire direction center (FDC) will order the forward observer to initiate the adjustment of the smoke on the target in time to complete the adjustment before the time indicated for the establishment of the smokescreen.

m. The fire support coordinator should inform the supported commander of the need for adjusting smoke prior to the establishment of the screen. This factor may influence the commander's decision as to the timing of the smokescreen, since the adjustment may alert the enemy.

n. The amount of ammunition to be fired is not indicated below the horizontal line in the field artillery fire support table because the amount of smoke ammunition to be expended will vary with such factors as wind direction and wind speed. The type of screen to be established and the type of smoke shell to be employed are indicated in the remarks column of the fire support table.

o. Upon receipt of the smoke support appendix, field artillery unit fire direction centers plot the targets, compute the initial firing data, and alert the forward observers who can adjust the smoke. An example of a smoke support appendix is shown in appendix M.

10–26. FO and FDC Procedures for Establishing Smokescreens

Forward observer and fire direction center procedures for establishing smokescreens are prescribed in FM 6–40.

10–27. Determining Smoke Ammunition Requirements

a. Smoke Ammunition Expenditures. Expenditures of smoke ammunition vary considerably with each specific mission. Although smoke ammunition expenditure tables (tables 10–1 and 10–2) have been prepared for various field artillery weapons under a variety of weather and terrain conditions, they are useful as a *guide only.* The amount of smoke ammunition required to maintain a smokescreen must be determined by observation rather than by use of figures in a table. Observers must be trained to adjust a large-scale smokescreen, to alter the screen to fit changing conditions, to keep the screen free of holes and gaps, and to increase or decrease the expenditure of smoke ammunition when necessary.

b. Use of Tables. Tables 10–1 and 10–2 give the approximate number of rounds per minute required to maintain a smoke screen on a 500-meter front. Under normal conditions, about 3 minutes are required to adjust fire on the target and about 1 minute is required to establish the smokescreen. The smoke ammunition expenditures in these tables may be considered optimum for the stated conditions. The tables indicate the number of rounds that must impact in the target area. No allowance has been made for extra shells which, because of dispersion characteristics of the weapon, may be needed to insure that the required number fall in the target area. Additional ammunition required for this purpose must be considered by the commander of the firing unit, since dispersion varies with each type of weapon and increases with range.

c. Unit Capabilities. Unit capabilities to establish and maintain smokescreens vary widely according to the existing meteorological conditions in the target area. The size of an area over which a unit is capable of establishing and maintaining a smokescreen can be determined by the

unit's capability to deliver smoke rounds to the target (rate of fire), and the ammunition requirements for a 500-meter front (tables 10–1 and 10–2). For example, a mortar unit of four 4.2-inch mortars can effectively screen an average front of about 600 meters. Under favorable conditions, it can screen three times the average front; under certain unfavorable conditions, it can screen only ⅛ of the average front.

d. Smoke Requirements.

(1) *Smoke curtain.* Volley fire is used to establish a smoke curtain. Twice as much ammunition is required during the first minute to establish a smoke curtain as is required to maintain the curtain each subsequent minute.

(2) *Obscuring smoke.* Approximately twice as much ammunition is required per minute to produce an obscuring smoke effect on a 500-meter front as is required to maintain a smoke curtain on a 500-meter front.

Table 10–1. Smoke Ammunition Requirements for 105–mm and 155–mm Howitzers.

SMOKE CURTAIN[1]

Weapon	Number of WP rounds per minute required to maintain a smoke curtain on a 500-meter front			
	Head wind	Tail wind	Flank wind	Quartering wind
105–mm howitzer	22	22	8	17
155–mm howitzer	7	7	3	6

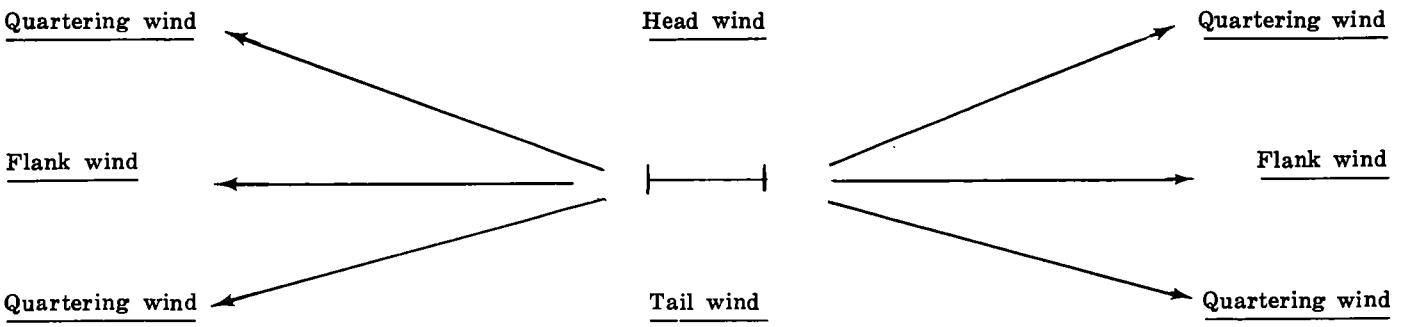
OBSCURING SMOKE EFFECT

Weapon	Number of WP or HC rounds per minute required to maintain an obscuring smoke effect on a 500-meter front			
	Head wind	Tail wind	Flank wind	Quartering wind
105–mm howitzer	50	39	8	33
155–mm howitzer	17	11	3	11

SMOKE CURTAIN USING HC BASE-EJECTION SHELL[2]

Weapon	Maximum meter between points of shell impact (parallel to front)		Rate of fire per point of impact (rounds per minute)		
	Head or tail wind	Flank wind	Wind speed		
			3 knots	9 knots	13 knots
105–mm howitzer	27	360	1.0	1.5	2.0
155–mm howitzer	27	360	0.6	0.9	1.2

[1] To establish a smoke curtain, employ volley fire, using 2-minute ammunition requirement. Equally space rounds on the front to be screened.
[2] To establish the initial curtain, fire two rounds per point of impact as quickly as possible; to maintain the curtain fire at the rate indicated.



Wind direction diagram

Table 10–2. Smoke Ammunition Requirements for 4.2-Inch Mortars.

SMOKE CURTAIN								
Number of WP rounds per minute required to maintain a smoke curtain on a 500-meter front in *flank winds*								
Relative humidity (percent)	Temperature gradient	Wind speed (knots)						
		2	4	9	13	18	22	26
30	Lapse	13	13	11	11	13		
	Neutral	9	9	7	7	9	9	11
	Inversion	6	6	4				
60	Lapse	9	9	7	9	9	9	
	Neutral	6	6	4	4	6	7	9
	Inversion	3	3	3				
90	Lapse	7	7	6	6	7		
	Neutral	4	4	3	3	4	6	6
	Inversion	3	3	3				
OBSCURING SMOKE EFFECT								
The number of rounds per minute required to maintain an obscuring smoke effect on a 500-meter front is obtained by doubling the values for a smoke curtain.								

[1] To establish a smokescreen, employ volley fire, using 2 minute ammunition requirement (but not less than 10 rounds). Equally space rounds on the front to he screened.

[2] For quartering winds, multiply the values in the tahle hy 2; for tail winds, by 2; for head winds, by 2½. Values for head and quartering winds are based on a curtain impact line of 500 meters in advance of the enemy line. Wind directions are with respect to the enemy target or smokescreen. If the curtain impact line is closer than 500 meters, ammunition requirements will he considerahly larger. CONTROLLED FIRE BY OBSERVERS IS NECESSARY AT ALL TIMES.

[3] Tahle is for ground impact. For water impact, multiply the values in the tahle by 1.4.

CHAPTER 11

AMMUNITION SERVICE

Section I. GENERAL

11–1. General

This chapter includes information on the interrelationships of tactics and ammunition service, the factors which govern the establishment and adjustment of ammunition supply levels, the tactical control of ammunition, and conventional and special ammunition supply procedures and service. It is intended to provide an insight into ammunition service and to promote understanding among tactical commanders and commanders having ammunition service responsibility. No amount of written doctrine can replace effective liaison and cooperation between commanders. For a complete discussion of ammunition service, to include definitions of conventional and special ammunition, see FM 9–6 and FM 100–10.

11–2. Tactical Control of Ammunition

a. Conventional Ammunition. The theater army commander allocates ammunition to each field army under his command. Field army commanders suballocate to subordinate corps. Corps commanders suballocate to each division. Each tactical commander normally allocates ammunition based on the main and the secondary tactical effort.

b. Special Ammunition. The allocation of special ammunition is from tactical commander to tactical commander; that is, from Commanding General, Theater, to Commanding General, Field Army, to Commanding General, Corps, to Commanding General, Division.

11–3. Interrelationships of Tactics and Ammunition Service

Ammunition service and supply has a direct influence on tactical operations. For this reason, tactical commanders should plan their operations and commit their forces fully aware of the capabilities of the ammunition service in the combat service support structure. Also, combat service support commanders should establish, stock, and employ ammunition service units fully aware of the operational plans of the tactical commanders. The success of combat support operations depends on the degree of coordination and the complete understanding of these two factors.

Section II. CONVENTIONAL AMMUNITION

11–4. Ammunition Supply Levels

Ammunition supply levels are normally expressed in terms of days of supply for each theater of operations and for each major command within each theater. The supply levels are established initially in accordance with available experience data on the amount of ammunition consumed per average day. Available ammunition assets are then announced in terms of average days. A day of supply is recomputed as additional consumption experience is gained. The logistical system attempts to match the receipt of ammunition to the consumption rate so that the desired balance of reserves on hand can be maintained. Therefore, above average consumption by one part of the force is balanced by limiting the consumption of another part of the force. Major commanders desire to maintain this level of supply as being the minimum acceptable level of reserves. To change the level of supply by increasing the rate of receipts requires a planning leadtime far exceeding the leadtime for tactical and operational planning. Factors which cause the long leadtime are procurement and production, order and shipping time, the type and quantity of transportation available, the amount of storage space in the thea-

ter, the physical security forces available to protect shipments and storage areas, and the degree of control over the tactical situation.

11-5. Ammunition Supply System

a. Ammunition directly influences tactical operations and is controlled by each commander in the tactical chain of command. The conventional ammunition supply system, known as the continuous refill system, is designed for fast resupply and is based on possession by the using units of a fixed basic load of ammunition which is replenished as used. Resupply of field artillery ammunition is critical since it represents the largest percent of the ammunition resupply tonnage.

b. Units replenish their basic loads from designated ammunition supply points (ASP). In an active situation, the basic load may be replenished at the time of, in expectation of, or after expenditure.

c. A unit preparing to defend against an attack may stockpile ammunition at weapon positions and draw ammunition from the ammunition supply point on an as needed basis for immediate use. A unit may draw, in excess of its basic load, ammunition "required for immediate consumption." Immediate consumption is interpreted to mean that the ammunition will be expended within 24 hours.

d. The amount of ammunition in a unit's possession may exceed the basic load for a short time. A unit drawing ammunition on the basis that it is needed for immediate use is, in effect, drawing ammunition in expectation of a future requirement. A temporary overage may be frequent and normal during continued fighting. Commanders must prevent ammunition overages from becoming excessive or prolonged.

11-6. Ammunition Supply Procedures

a. General. The procedures for supply and stock control of conventional ammunition involve the basic load, the required supply rate, the availab'e supply rate, and the functions of major command ammunition officers, as well as the staff responsibilities of the G3(S3) and G4(S4).

b. Basic Load. The basic load of field artillery ammunition is the quantity of ammunition which a unit is authorized to have in its possession based on rounds per weapon. The basic load is carried by organic equipment and personnel. Each commander must insure that his basic load is maintained at the prescribed level.

c. Required Supply Rate. The required supply rate (RSR) is the amount of ammunition, expressed in rounds per weapon per day, estimated to be required to sustain unrestricted operations of a force for a specified period. Field artillery commanders at division, corps, and army, working jointly with the force G3 and G4, recommend to the force commander the quantity of field artillery ammunition needed to support tactical operations. The estimates are based on the mission, experience data, the theater, knowledge of the enemy, and the plan of operation. The quantity of ammunition requested by each echelon is reviewed, evaluated, and consolidated at the next higher echelon. Final determination of ammunition requirements is made at theater level. Determination of the required supply rate is based on the mission, the plan of operation, the available weapons and units, and other fire support means.

d. Available Supply Rate. The available supply rate is the rate of consumption of ammunition, expressed in rounds per weapon per day, that can be sustained with available supplies for a specified period. The available supply rate is based on credit allocations from higher headquarters and on the tactical requirements of corps and other elements of the army. The corps commander announces an allocation of field artillery ammunition to the corps field artillery units and the divisions of the corps, based on recommendations of the corps field artillery commander. Ammunition at division level is similarly allocated. The available supply rate among units of the same type often varies with the mission of the units, available targets, and plan of the supported unit. Authority from the next higher commander is required before a unit may exceed its available supply rate. The available supply rate is published in the administrative/logistics order and in paragraph 4 of the fire support annex to the operation order or as a fragmentary order.

Section III. SPECIAL AMMUNITION

11-7. Ammunition Supply Procedures

a. Control. The control of special ammunition is a command function. The G3 has primary general staff responsibility for controlling special ammunition expenditures. Control of special ammunition issues to support tactical plans and opera-

tions is a primary staff responsibility of the G4. The G4 accomplishes logistical movement and positioning of special ammunition based on the operational plans of the G3. Control of special ammunition expenditures or issues may be accomplished in the fire support coordination center or fire support element of a tactical operations center. SOP's must provide for communication and liaison between tactical headquarters and special ammunition supply points (SASP) to allow commanders at division and higher levels to discuss the expenditure and issue of weapons allocated to them.

b. Special Ammunition Load. The special ammunition load (SAL) is a specific quantity of special ammunition to be carried by a delivery (firing) unit. The establishment and replenishment of the special ammunition load are command functions of the senior tactical commander (normally the field army commander) and depend on the mission, the tactical and logistical situation, and the capability of the delivery unit to transport or use the load. The special ammunition load may vary from day to day and among similar delivery units.

11–8. Denial of Nuclear Weapons

a. Primary Means. The primary means of nuclear weapons denial is the maintenance of adequate weapon security. Under conditions in which weapons security may not provide adequate denial, and capture of the nuclear weapons is a threat, the senior commander of the unit having possession of the nuclear weapons must take alternative steps to deny the weapons to the enemy. The method of denial chosen will be based on the nature of the threat, the time available to execute denial measures, the environment in which the weapons are stored, and the resources available to accomplish denial.

b. Primary Objective. The primary overriding objective of denial of nuclear weapons is to render the weapons tactically useless to the enemy. Efforts to deny the weapon design features and active material to the enemy, if not accomplished concurrently with tactical denial measures, will be attempted only after accomplishment of the primary objective is assured.

c. Forms of Denial. The most desirable form of denial of nuclear weapons is the physical removal of the weapons from the area of the threat; i.e., local relocation or evacuation. If relocation is impractical, evacuation of sensitive weapons or selected key weapon components should be considered. Under no circumstances should weapon relocation place the weapons or weapon components in a more precarious position.

d. Destructive Denial Methods. Under emergency conditions in which no form of nuclear weapon relocating is possible or advisable, and gainful and expeditious employment of the weapon against the enemy is impossible, destructive denial becomes necessary. The destructive denial methods for each weapon system are described in the user technical manual (TM). In general, violent means of destructive denial, i.e., initiation of warhead HE, should be elected if the situation permits this greater degree of weapon destruction to be achieved. If the denial of the threatened nuclear weapon by violent means is unacceptable, disablement of selected key weapon components provides a simple, rapid, though less effective method of denial of weapon tactical utility. Such disablement may be followed by violent weapon destruction to enhance denial of weapon design information and prevent acquisition of active material if subsequent alterations to the tactical situation permit.

e. Denial SOP. Nuclear weapons are sufficiently important, sensitive, and scarce enough to dictate that procedures for their denial are the personal concern of the commander and require his decision in each area under varying circumstances of operation. Instructions for nuclear weapon denial should be included, therefore, in unit SOP's where applicable. Such instructions should cover all details necessary for the individual who executes them, including—

(1) Origin of the decision to carry out emergency denial. This may include delegation by the commander of authority to execute weapon relocation or destructive denial.

(2) Step-by-step procedures, including different ones that may be required in movement, in firing position, in position of readiness, or at a storage site.

(3) Instructions for the location of necessary denial equipment to insure ready accessibility under all circumstances of storage, movement, position of readiness, and firing configuration.

CHAPTER 12

FIELD ARTILLERY COMMUNICATIONS

Section I. GENERAL

12–1. General

The ability of field artillery to render effective fire support depends on efficient communications. The field artillery commander must rely on his communication system in controlling elements of his command, in gathering information and distributing intelligence, and in coordinating the fires of his unit and other fire support means, as appropriate. Responsibility for communication rests with the commander at each echelon.

12–2. Area Communication System

The area communication system is used to augment field artillery communication systems and to provide an alternate means of communication. The area system offers a means for expeditiously establishing a wire network between field artillery elements when the installation and maintenance of long lines are beyond the capabilities of the units. Field artillery units sometimes use the area system on a common-user basis. However, when field artillery uses the area system for transmitting fire control traffic, sole-user circuits must be provided.

12–3. Priority of Installation

In the establishment of field artillery communication systems, priority of installation is given to elements concerned with fire support and fire direction.

Section II. COMMUNICATION PLANNING AND ELECTRONIC WARFARE

12–4. Communication Planning

Communication planning is a continuous operation which begins with the commander's estimate of the situation. Field artillery communication plans include all details necessary to clarify and coordinate signal activities such as wire installation and recovery, radio transmission and retransmission, and common- and sole-user circuits in an area system. The techniques concerning field artillery communications are discussed in detail in FM 6–10.

12–5. Electronic Warfare

a. General. Electronic warfare (EW) is military action involving the use of electromagnetic energy to determine, exploit, reduce, or prevent hostile use of the electromagnetic spectrum, and action taken to retain friendly use of the electromagnetic spectrum.

b. Electronic Warfare Terminology. There are three major subdivisions of electronic warfare.

(1) Information-gathering activities are called electronic warfare support measures (ESM). ESM is that division of electronic warfare that involves actions taken to search for, intercept, locate, record, and analyze radiated electromagnetic energy for the purpose of exploiting such radiations in support of military operations. Thus, ESM provides a source of EW information required to conduct electronic countermeasures and electronic counter-countermeasures. ESM includes such functions as threat detection, warning, avoidance, target acquisition, and homing.

(2) Offensive activities are called electronic countermeasures (ECM). ECM is that division of electronic warfare that involves actions taken to prevent or reduce an enemy's effective use of the electromagnetic spectrum. ECM includes jamming and deception. Jamming is the deliberate radiation, reradiation, or reflection of electromagnetic energy with the object of impairing the use of electronic devices, equipment, or systems being used by an enemy. Deception is the deliberate radiation, reradiation, alteration, absorption, or re-

flection of electromagnetic energy in a manner intended to mislead an enemy in the interpretation or use of information received by his electronic systems.

(3) Protective, or defensive, activities are called electronic counter-countermeasures (ECCM). ECCM is that division of electronic warfare that involves actions taken to insure friendly effective use of the electromagnetic spectrum despite the enemy's use of electronic warfare.

c. Electronic Warfare Threat. In field artillery, electronic systems are used for signal communications, missile guidance and control, target acquisition means, direction control for weapons, navigational aids, and weapons fusing. Because this dependence on electronic devices makes field artillery vulnerable to hostile actions which reduce the effectiveness of these systems, the electromagnetic environment has become increasingly important in the conduct of modern warfare. Analysis of transmissions intercepted by enemy ESM and communications intelligence (COMINT) resources can result in the determination of the type, purpose, location, and composition of radio nets and associated field artillery units. Since effective field artillery operations depend on adequate and continuous communications, commanders must give special attention to adherence to sound communications security (COMSEC) practices and appropriate electronic counter-countermeasures (ECCM).

d. References. For complete information and details regarding electronic warfare see (C) FM 32–20, FM 6–10, and (C) AR 105–87. For communications security information, see (C) FM 32–5.

APPENDIX A

REFERENCES

A–1. Army Regulations (AR)

10–6	Branches of the Army
50–5	Nuclear Surety
70–39	Criteria for Air-transport and Air-drop of Materiel
(C) 105–87	Electronic Warfare (U)
220–58	Organization and Training for Chemical, Biological, and Radiological (CBR) Operations
310–25	Dictionary of United States Army Terms
310–50	Authorized Abbreviations and Brevity Codes
380–5	Safeguarding Defense Information
380–55	Safeguarding Classified Defense Information in Movement of Persons and Things
385–63	Regulations for Firing Ammunition for Training, Target Practice, and Combat

A–2. Field Manuals (FM)

1–100	Army Aviation Utilization
3–2	Tactical Employment of Riot Control Agent CS
3–10-series	Employment of Chemical Agents
3–12	Operational Aspects of Radiological Defense
3–50	Chemical Smoke Generator Units and Smoke Operations
6–2	Field Artillery Survey
6–10	Field Artillery Communications
6–40	Field Artillery Cannon Gunnery
6–102	Field Artillery Battalion, Aerial Field Artillery
6–121	Field Artillery Target Acquisition
6–122	Artillery Sound Ranging and Flash Ranging
6–140	Field Artillery Organizations
6–141-series	Non-Nuclear Employment of Field Artillery Weapons System (U)
6–160-series	Radar Sets
7–10	The Rifle Company, Platoons, and Squads
7–20	The Infantry battalions
7–30	The Infantry Brigades
9–6	Ammunition Service in the Theater of Operations
17–30	The Armored Brigade
21–30	Military Symbols
21–40	Chemical, Biological, Radiological, and Nuclear Defense
24–1	Tactical Communications Doctrine
29–2	Organizational Maintenance Management
29–30–1	Division Maintenance Battalion
29–23	Direct Support Maintenance Battalion (Nondivisional)
29–35	Maintenance Support in Separate Brigades
30–5	Combat Intelligence
(C) 31–1 (Test)	Employment of Unattended Ground Sensors (U)

31–11	Doctrine for Amphibious Operations
31–16	Counterguerrilla Operations
31–22	US Army Counterinsurgency Forces
31–23	Stability Operations, US Army Doctrine
31–25	Desert Operations
31–35	Jungle Operations
31–36 (Test)	Night Operations
31–50	Combat in Fortified and Built-up Areas
31–60	River Crossing Operations
31–71	Northern Operations
31–72	Mountain Operations
31–75	Riverine Operations
31–85	Rear Area Protection (RAP) Operations
(C) 32–5	Signal Security (SIGSEC) (U)
(C) 32–20	Electronic Warfare (Ground Based) (U)
33–1	Psychological Operations, US Army Doctrine
33–5	Psychological Operations, Techniques and Procedures
44–1	US Army Air Defense Artillery Employment
44–3	Air Defense Artillery Employment, Chaparral/Vulcan
55–30	Army Motor Transport Operations
57–1	US Army/US Air Force, Doctrine for Airborne Operations
57–35	Airmobile Operations
60–30	Embarkation and Loading, Amphibious
61–24	Division Communications
61–100	The Division
100–5	Operations of Army Forces in the Field
100–10	Combat Service Support
100–26	The Air-Ground Operations System
100–30 (Test)	Tactical Nuclear Operations
101–5	Staff Officers' Field Manual: Staff Organization and Procedures
101–10-series	Staff Officers' Field Manual: Organizational, Technical, and Logistical Data
101–31–1	Staff Officers' Field Manual: Nuclear Weapons Employment, Doctrine and Procedures

A–3. Technical Manuals (TM)

3–210	Fallout Prediction
3–220	Chemical, Biological, and Radiological (CBR) Decontamination
9–1300–203	Artillery Ammunition
9–1300–206	Care, Handling, Preservation, and Destruction of Ammunition
55-series	Transport
55–450–15	Air Movement of Troops and Equipment (Administrative)

A–4. Department of the Army Pamphlets (Da Pam)

39–3	The Effects of Nuclear Weapons
310–1	Military Publications: Index of Administrative Publications
310–3	Military Publications: Index of Doctrinal, Training, and Organizational Publications
310–4	Military Publications: Index of Technical Manuals, Technical Bulletins, Supply Manuals (types 7, 8, and 9) Supply Bulletins, and Lubrication Orders
350–15-series	Operations—Lessons Learned

A–5. Miscellaneous Publications

AAP–6 (J)	NATO Glossary
ATP 6–100	Field Artillery Cannon Units

ATP 6-175	Field Artillery Rocket Units, Honest John Rocket
ATP 6-555	Field Artillery Battalion, SERGEANT
ATP 6-558	Field Artillery Searchlight Battery
ATP 6-575	Field Artillery Target Acquisition Battalion
ATP 6-615	Field Artillery Battalion, PERSHING
JCS Pub 1	Dictionary of US Military Terms for Joint Usage

APPENDIX B
DEFINITIONS

(For definitions not shown here, see AR 310-25, Dictionary of United States Army Terms)

Airspace control—Airspace control consists of the coordination, integration, and regulation of the use of airspace of defined dimensions. In this context, coordination is that degree of authority necessary to achieve effective, efficient, and flexible use of airspace without providing command authority. Integration considers the necessity to consolidate requirements for the use of this airspace in the interest of achieving a common objective at the lowest possible level of effort. Regulation indicates the requirement to supervise activities in this airspace to provide for flight safety and connotes the authority required to insure such safety. Airspace control, therefore, denotes a service provided in order to permit flexibility of actions while authority to approve, disapprove, deny or delay operations is vested only in the joint force commander. In the context of the foregoing definition, when airspace is controlled, its commander controls his airspace, and his staff coordinates and integrates, and regulates its use in accordance with his directives.

Airspace coordination—A specialized service to assist the commander in meeting his responsibilities for control of his organic forces and for coordination with other airspace users. The service is designed to minimize mission conflict, to promote safety among all airspace users, and to increase operational effectiveness. The coordination service may apply to specified airspace, to open field airspace users, or to both. The coordinating mechanism established for the task may or may not be provided in command authority. The S3/G3 exercises overall staff supervision and the ACE implements. The S3/S3 Air serves in the absence of an ACE-type facility.

Airspace coordination element—An element in tactical operations center that coordinates the use of airspace over the command area.

Allocation (nuclear)—The apportionment of specific numbers and types of nuclear weapons to a commander for a stated time period as a planning factor for use in the development of war plans. (Additional authority is required for the actual dispersal of allocated weapons to locations desired by the commander of support his war plans. Expenditures of these weapons are not authorized until released by proper authority.)

Assignment (nuclear)—A specified number of complete nuclear rounds authorized for expenditure by a commander. An assignment may be made for a specific period of time, for a phase of an operation, or to accomplish a particular mission.

Cancel—When coupled with an order, other than an order for a quantity or type of ammunition, cancel rescinds that order.

Counterflak fire—Fire used to suppress antiaircraft fire immediately prior to or during an air attack on enemy positions.

Defensive fire—Fire delivered by supporting units to assist and protect a unit engaged in a defensive action.

Direct air support—All forms of air support provided to land or naval forces which immediately assist those forces in the tactical battle.

Free-fire area—A specific, designated area into which any fire support means may deliver fires against known or suspect ground targets without any coordination between the force requesting and/or delivering the fires and the agency that established the free-fire area.

Free-fire line—A line beyond which fires may be delivered without any coordination between the force requesting and/or delivering the fires and the agency that established the free-fire line. The free-fire line is used primarily during stability operations and normally requires approval by the host country. The division artillery coordinates the establishment of the free-fire line to the division fire support element and higher, organic, attached, supporting, and adjacent units.

Group of targets—Two or more targets in the same general area on which fire is desired simultaneously. A group of targets is designated by a letter/number combination or by a nickname.

Hovering fire—Fire delivered by an armed helicopter as it momentarily rises from a covered or concealed position.

Illumination fire—Fire designed to illuminate an area.

Immediate air request—A request by a ground commander for a close air support strike on a target which is exposed by battlefield developments and which, by its nature, could not be identified sufficiently in advance to permit detailed mission coordination and planning.

Marking fire—Fire placed on a target for the purpose of identification.

Naval gunfire officer—A special staff officer of a troop unit (division or higher) whose duties pertain to the planning and execution of naval gunfire support and naval gunfire training and to the coordination of naval gunfire with other supporting arms.

No-fire area—A specific, designated area into which no fire support means will deliver fires and into which no effects from their fires will extend. Exceptions are: On a mission basis when approved or requested by the establishing agency; and When a major threat exists and the commander has insufficient time to obtain approval.

Offensive fire—Fire delivered by supporting units to assist and protect a unit engaged in an offensive action.

On-call target—A planned target, other than a scheduled target, for which a need can be anticipated.

Planned target—A target on which fire is prearranged. Planned targets may be scheduled or on call.

Program of targets—Planned targets of a similar nature, such as hostile cannon, mortars, missiles, and command installations. A program may be scheduled or on call.

Field artillery fire quick support plan—A document that is prepared at a lower echelon in support of a quick attack and that contains the necessary elements of an artillery fire support appendix.

Running fire—Fire delivered by an armed helicopter while the helicopter is in forward flight.

Scheduled target—A target on which fire is to be delivered at a specific time during the operation of the supported force. The time is specified in terms of the accomplishment of a predetermined movement or task.

Series of targets—A number of targets and/or groups of targets planned to support a maneuver phase. A series of targets may be designated by a nickname.

Stationary fire—Fire delivered by an armed helicopter from a static ground position.

Superimposed—A term used in fire planning to indicate that a field artillery unit is bolstering fire on a target and that its fire may be lifted from that target by the authority implicit in its fire support role (non-US).

Target overlay—A transparent sheet which, when superimposed on a particular chart, map, drawing, tracing, or other representation, depicts target locations and designations. The target overlay may also show boundaries between maneuver elements, objectives, and friendly forward dispositions.

APPENDIX C

TARGET NUMBERING SYSTEM (QSTAG 221)

C–1. Purpose

The target numbering system provides for the following requirements:

a. Identification of Planning Source. The planning source of each target should be readily identifiable so that each field artillery and force echelon can obtain or provide additional information, eliminate conflicts and duplications, and notify the originator of the action taken on requests.

b. Preclusion of Duplication. Each target within a corps area should have a separate and distinctive designation to insure rapid resolution of duplication and quick response to fire requests.

c. Compatibility with Computer. In the near future, the target numbering system for computers will be a combination of two letters and four digits.

(1) Each target number will consist of two alphabetic positions followed by four numerical positions. Until all ABCA countries (America, Britain, Canada, Australia) have secure communications, the United Kingdom, Canada, and Australia (UK/CDA/AUST) will identify their targets by the letter Z in the first alphabetic position. This use of Z is shown in paragraph C–2*a*(2).

(2) When all ABCA countries have the post-1970 computer equipment, they will use the target numbering system herein described without the Z set-aside portion.

d. Distinctive Identification of Special Weapons Targets. The target numbering system should differentiate between conventional and special weapons targets and between various types of special weapons targets; e.g., nuclear and toxic chemical targets.

(1) *Nuclear.* The current system is a classified NATO procedure.

(2) *Toxic Chemical.* Because of the relatively large area of effects the variances that are based on atmospheric conditions, and the troop safety considerations, the target areas have distinctive identification.

e. Distinctive Identification of Counterbattery Targets. Counterbattery targets should have distinctive identification because of the special acquisition measures, the programs of targets, and the methods of engagement.

f. Security. The target numbering system must conform to security requirements.

C–2. System

A target is designated by two elements—a two-letter group and a four-digit group.

a. Letters. The two-letter group denotes the originator of the target in the US system and the level of classification in the UK/CDA/AUST system. The letters I and O will not be used. Letter designations in a type corps are allotted as follows:

(1) *US* (letters assigned by corps).	*Letters*
Attached divisions in numerical order (first letter)	A through G
Armored cavalry regiment (first letter)	H
Additional separate regiments, brigades, and as desired (first letter)	J through W
Field artillery groups of corps artillery additional corps, field artillery groups, separate battalions, and as desired	XA through XE XF through XX
Corps artillery FDC	XY
Corps FSE	XZ
Not used (first letter)	Y and Z

(2) *UK/CDA/AUST* (assigned letters).	*Letters*
As desired	ZA through ZN
Batteries	ZP through ZS
Field regiment	ZT

Division artillery	ZU
Field artillery with the corps	ZV
Corps field artillery units	ZW
As desired	ZX
Not used	ZY and ZZ

(3) *US* (letters assigned by division). In US divisions, a second letter is assigned to each major subordinate unit.

US units	*Letters*
Brigades in numerical order	A through E
Organic field artillery battalions in numerical order	F through L
Attached field artillery or as desired	M through W
Not used	X
Division artillery FDC	Y
Division FSE	Z

(4) *US* (other corps units). Units which have been assigned an alphabetical designation and which are responsible for fire planning (e.g., separate brigades) may assign a second letter to their subordinate units as desired.

b. Numbers. The four-digit group follows the two-letter group to designate each specific target as a separate entity.

(1) *US units.* Units assigned a two-letter group assign numbers as shown in (*a*) through (*g*) below.

(*a*) *Brigades of the division.*

Units	*Numbers*
Brigade HQ	0001 through 0999
Lowest numbered maneuver battalion	1000 through 1999
Next higher numbered maneuver battalion attached	2000 through 2999
Next higher numbered maneuver battalion attached	3000 through 3999
Next higher numbered maneuver battalion attached	4000 through 4999
Next higher numbered maneuver battalion attached	5000 through 5999

(*b*) *Maneuver battalion of divisional brigades.* Within the block of 1000 numbers assigned to a maneuver battalion, the following groups of numbers may be further assigned to subordinate units:

Units	*Numbers*
Battalion headquarters, as desired	1000 through 1166
Heavy mortar platoon	1167 through 1333
Company A	1334 through 1500
Company B	1501 through 1667
Company C	1668 through 1834
Company D	1835 through 1999

(*c*) *Direct support field artillery battalions of divisions artillery.*

Units	*Numbers*
Fire support officer at brigade FSCC	1000 through 1999
Fire support officer with lowest numbered maneuver battalion (FSCC)	2000 through 2999
Fire support officer with next higher numbered maneuver battalion (FSCC)	3000 through 3999
Fire support officer with next higher numbered maneuver battalion (FSCC)	4000 through 4999
Fire support officer with next higher numbered maneuver battalion (FSCC)	5000 through 5999
Fire support officer with next higher numbered maneuver battalion (FSCC)	6000 through 6999
Field artillery battalion FDC as desired (firing batteries of the battalion)	7000 through 7999
Counterbattery targets	8000 through 8999
Toxic chemical targets	9000 through 9999

(*d*) *Forward observers.* The targets planned by the field artillery forward observers will be assigned numbers by the fire support officer with the maneuver battalion or task force from his block of allotted numbers.

(*e*) *All other headquarters with an alphabetical designation responsible for fire planning.*

1. The block of numbers 0001 through 0999 is reserved for maneuver units ((1) and (4) above).

2. The block of numbers 1000 through 9999 is reserved for artillery units. Numerical designations can be made as desired, except that the blocks of numbers 8000 through 8999 and 9000 through 9999 will be reserved for counterbattery and toxic chemical targets, respectively.

(*f*) *Targets to be engaged with air-delivered weapons.*

1. Conventional. The S3 (G3) air will obtain numbers from the FSCC/FSE's blocks of assigned numbers with which to designate the targets to be engaged by aircraft.

2. Nuclear. Targets to be engaged with air-delivered nuclear weapons are designated by numbers from the classified four-digit block assigned to that command echelon.

3. Chemical. Targets to be engaged with air-delivered toxic chemical weapons are designated by numbers from the 9000 through 9999 block of numbers assigned to that command echelon.

(*g*) *Targets to be engaged by naval gunfire.* Naval gunfire spotters and liaison officers will obtain numbers from the FSCC/FSE's blocks of numbers.

(2) *UK/CDA/AUST units.* Blocks of classified four-digit numbers are assigned to command echelons. There is no duplication of numbers. The 8000 through 8999 and the 9000 through 9999 blocks of numbers are reserved for counterbattery and toxic chemical targets, respectively.

(3) *Joint techniques.*

(*a*) *Counterbattery targets.* Counterbattery targets are identified by the block of numbers 8000 through 8999.

(*b*) *Chemical targets.* Toxic chemical targets are identified by the block of numbers 9000 through 9999, which are assigned by the CP/FSCC/FSE of the echelon that is assigned chemical munitions.

(*c*) *Nuclear targets.* Classified numbers are allocated to the corps and, in turn, to the division and the brigades.

C–3. Modifications

Modifications to target numbering systems should be minimized since target numbers identify the planning source and changes to the system will require wide circulation to avoid confusion. Such modifications should not be reflected in target information transmitted from one headquarters to another.

C–4. Security

a. US.

(1) Target numbers may be sent in the clear when the tactical situation demands or when the enemy does not possess the intelligence-gathering capability to determine friendly order of battle information or the location of the friendly units.

(2) When the enemy possesses the capability to determine order of battle information and the location of friendly units, target numbers should be sent over secure means of communication or the letter prefixes should be encoded for transmission over insecure means. Current on-line cryptographic equipment, classified radio telephone call signs, and operations codes provide quick, secure means of transmission. Secure digital data devices, voice scramblers, and other items expected to be available by post-1970 will provide additional capabilities for security.

b. UK/CDA/AUST. Target numbers are allotted to units/formations in jumbled blocks. The allocation is classified.

Chart C-1. United States / United Kingdom / Canada / Australia Target Numbering System.

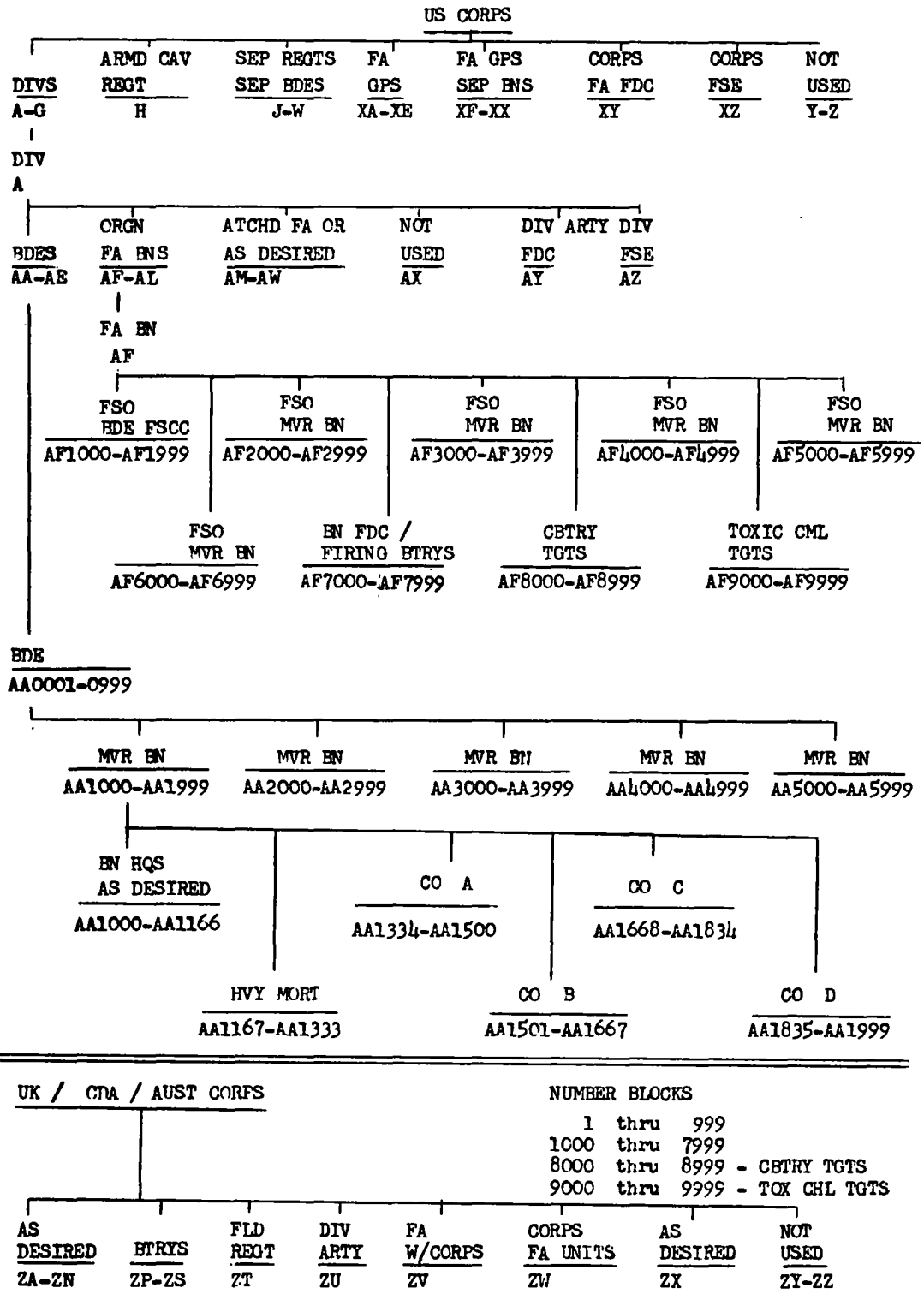
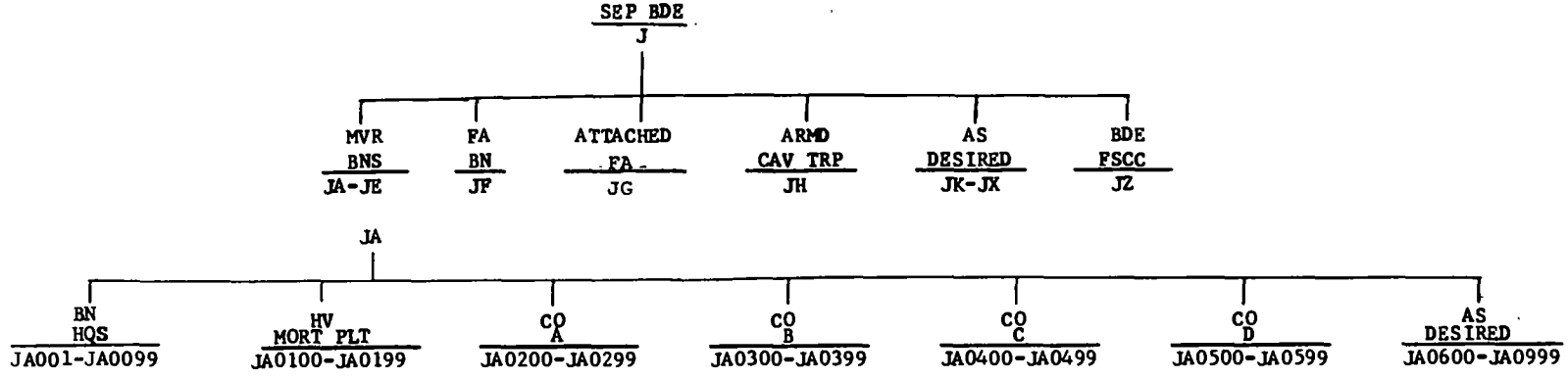


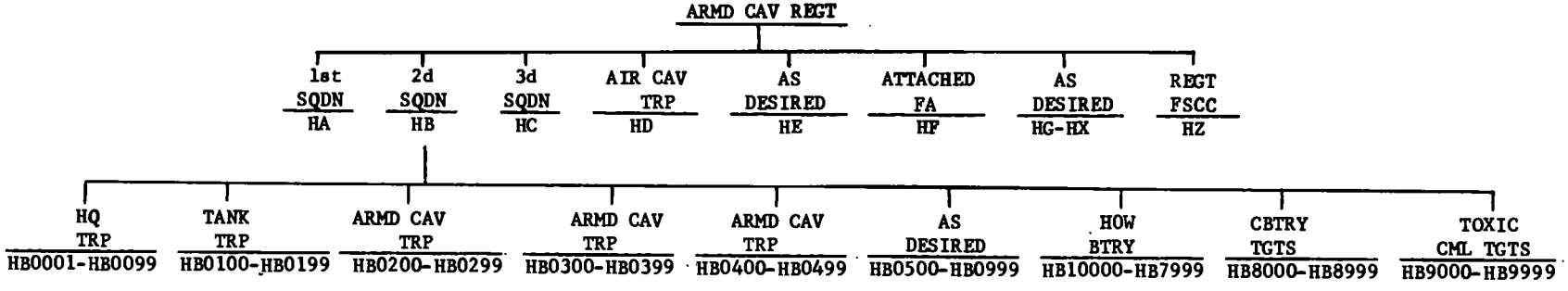
Chart C-2. Separate Brigade



Note: (1) The field artillery target numbering system for a separate brigade is the same as that for a direct support field artillery battalion organic to a division.

(2) When a field artillery group is attached to a brigade, the group headquarters will be assigned the two-letter prefix JG. Each of the battalions of the group will be assigned a two-letter prefix from the block of letters JK through JX.

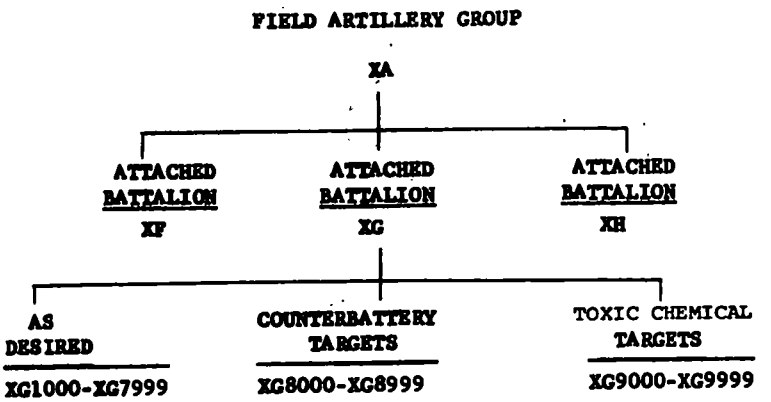
Chart C-3. Armored Cavalry Regiment



Note: (1) The field artillery target numbering system for an armored cavalry regiment is the same as that for a direct support field artillery battalion organic to a division.

(2) When s field artillery unit is attached to or placed in direct support of an armored cavalry regiment, the field artillery unit will be assigned the two-letter prefix HF. When a field artillery group is attached to or placed in direct support of a regiment, the field artillery headquarters will be assigned the two-letter prefix HF. Each of the battalions of the group will be assigned a two-letter prefix from the block of letters HE through HX.

Chart C-4. Field Artillery Group



APPENDIX D

CORPS FIRE SUPPORT ANNEX

(Classification)

Annex D (FIRE SUPPORT) to OPORD 16—2d US Corps
Reference: Map, series A511-KNAP, Sheets Q4, Q5, and R4, and R5 (NORTHWISE); Time Zone Used Throughout the Order: ZULU

1. SITUATION.

a. Enemy Forces. Annex A (Intelligence)

b. Friendly Forces.

(1) 1st US Army continues atk 24 May to trap and destroy enemy between the WAMME (NB3886) and OSTE (NC00244) Rivers and to destroy enemy in zone.

(2) 1st Corps attacks 24 May to secure crossings over WAMME NB4653) and HUNTE (NC5944) Rivers and to destroy enemy in zone.

(3) 9th TAF supports 1st US Army.

(4) 1-96 FA (Pershing): GS 1st Army; priority of fires to 2d Corps.

(5) Naval support: Naval Fire Support Group (TG 34.1) supports 2d Corps.

(6) 401st AD Group provides DS to 2d Corps

c. Attachments and Detachments. 10 May task organization.

2. MISSION.

Field artillery with the corps and other fire support agencies support 2d US Corps operations with special and conventional field artillery, naval gunfire, and air support. Corps attacks 240830 May; secures crossings over GRUNIG River and to prepare to destroy enemy in zone.

3. EXECUTION.

a. Concept of Operation. OPORD 16. (Extract Attached at Tab A)

b. Air Support.

(1) General.

(a) Current air operations continue.

(b) Priority of available air support to 10th Inf Div (Mech).

(2) Allocations.

(a) Air support allocated to 2d US Corps; 50 close air support and 20 tactical air reconnaissance sorties per day for period 240300 to 260300 May. TAF provides air alert aircraft for heliborne operations on request.

(b) Suballocation of daily sorties for planning purposes:

2d Corps	24 (includes 20 air recon)
1st Inf Div (Mech)	7

(Classification)

(Classification)

4th Armd Div ---------- 7
10th Inf Div (Mech) ---------- 25
12th Inf Div (Mech) ---------- 7

(c) TACP assignment: SOP
(d) DASC located at TOC.

(3) Miscellaneous. Appendix 1 Air Force Support.

c. Field Artillery Support.

(1) General. FA supports the atk with a preparation beginning with special and conventional fires at H–25.

(2) Organization for combat.

(a) 101st FA Gp: GS
2–50 FA (155-mm, SP)
2–60 FA (155-mm, Towed)
1–70 FA (8-in, SP)
1–82 FA (HJ)
2–82 FA (HJ)

(b) 103d FA Gp: GS
4–50 FA (155-mm, SP)
2–62 FA (175-mm, SP)
2–70 FA (8-in, SP)
3–70 FA (8-in, SP)

(c) 10th FA Gp: GS
1–92 FA (Sergeant)
1–41 FA (105-mm, Towed)
1–120 FA (Aerial FA)
2–51 FA (155-mm, Towed)

(d) A/1–37 FA (Slt) GS
(e) 1–39 FA (Tgt-Acq) GS

(3) Miscellaneous.

(a) Restrictions on FA fires during heliborne operations to be announced.
(b) Priority of position areas to nuclear firing units.
(c) Appendix 2, Field Artillery Fire Support.

d. Chemical Support.

(1) General. Toxic chemical agents will be employed on enemy forward positions to assist in the penetration.

(2) Assignment (240600–260600 May).

Unit	Total GB VX	155–mm how GB VX	8–in how GB VX	HJ GB	M91 GB VX (ripples)	Air GB (bomb)	Air VX (Spray tank)
2d Corps	2912/1575	2400/1200	100/60	12	0/0	400	
1st Inf Div	2818/1508	2400/1200	80/40	6	12/12	320	
12th Inf Div (Mech)	2800/1569	2800/1200	80/40	6	14/14	400	
10th Inf Div (Mech)	2920/1578	2500/1500	80/40	8	12/12	320	26
4th Armd Div	2618/1052	2200/1000	80/40	6	12/12	320	

(3) Miscellaneous. Appendix 8, Chemical Fire Support and Appendix 7, Special Ammunition Logistics.

(Classification)

(Classification)

e. Naval Gunfire Support.

(1) General. TG 34.1 supports 2d US Corps during period 240600 to 260600 May. Ships will participate in preparation fires with conventional ammunition.

(2) Allocations.

(a) TU 34.12 supports 10th Inf Div (Mech).

(b) TU 34.13 supports 1st Inf Div.

(3) Miscellaneous. Appendix 4, Naval Gunfire Support.

f. Nuclear Fire Support.

(1) General.

(a) Ninety-two nuclear weapons assigned to 2d Corps. Yields from 1 to 50 KT.

(b) Atk means available within corps are FA cannon and missile. Tac Air available on request.

(2) NUCLEAR ASSIGNMENT/ALLOCATION (240500—261800 May)

1	2	3	4	5	6	7	8	9	10	11	12
	TOTAL	155-mm/SRC/1 KT	8-in/MRC/2 KT	HJ/FFR/5 KT	HJ/FFR/10 KT	SGT/MGM/20 KT	SGT/MGM/50 KT	Ftr/ADW/10 KT	Ftr/ADW/20 KT	Ftr/ADW/50 KT	Remarks
2d Corps	92	15	16	18	20	6	3	4	7	3	
Corps targets	24		2	3	13	2	1	1	2		
1st Inf Div Phase I	6	3	2	1							
1st Inf Div Phase II [2]	(3)	(1)	(1)	(1)							
10th Mech Div Phase I	9	2	3	3	1						Main attack
10th Mech Div Phase II [2]											Follow & support
12th Mech Div Phase I	6	2	2	1	1						
12th Mech Div Phase II [2]	(5)	(2)	(1)	(1)	(1)						
4th Armd Div Phase I											Reserve
4th Armd Div Phase II [2]	(10)	(2)	(3)	(3)	(2)						Main attack
___ Armd Cav Regt Phase I											
___ Armd Cav Regt Phase II [2]	(1)	(1)									Protect south flank
___ Sep Inf Bde (Mech) Phase I											Attch 1st Inf Div
___ Sep Inf Bde (Mech) Phase II [2]											Reserve
Corps res [1]	47	8	7	10	5	4	2	3	5	3	

[1] Includes those allocations made for phase II.

[2] Allocations for phase II.

(Classification)

(Classification)

(3) Miscellaneous. Appendix 5, Nuclear Fire Support and Special Ammunition Logistics and Appendix 7, Special Ammunition Logistics.

g. Coordinating Instructions.

(1) Troop safety.

(a) Preclusion requirements and troop safety needs as indicated in Appendix 5, Nuclear Fire Support.

(b) Warning per corps SOP.

(2) Notification of intent to use nuclear weapons to Corps FSE when effects extend beyond division boundaries.

(3) Report of damage assessment to TOC on completion of study.

(4) Corps air and FA fire support appendixes to corps FSE by 232400 May.

(5) Air targets will be marked with yellow smoke.

(6) FSCL is RED River eff 240700 May.

(7) Counterbattery status is active. Criteria same as OPORD 15.

4. SERVICE SUPPORT

a. 1st Army Admin/Log Order 2.

b. Materiel and Services, CL V ASR 240500–301800 June

(1) 105-mm how	160
(2) 155-mm how	130
(3) 175-mm gun	80
(4) 8-in how	100

5. COMMAND AND SIGNAL

a. Signal.

(1) Index 1–7, SOI, eff 220001 May.

(2) Joint CEOI Index 22–3a eff 220001 May.

b. Command.

(1) Corps FSE located at corps CP.

(2) Corps artillery CP PS0508.

(3) DASC located at corps CP.

Acknowledge

CANNON
LTG

OFFICIAL:
/s/Gunn
Gunn
G3

Tab A Extract of OPORD 16
Appendixes: 1—Air Fire support
2—Field Artillery Fire Support
3—Chemical Fire Support
4—Naval Gunfire Support
5—Nuclear Fire Support
6—Illumination Support
7—Special Ammunition Logistics (omitted)
8—Air Defense Artillery Fire Support

(Classification)

(Classification)

Distribution: A
1st Corps
3d Corps
Naval Fire Support Group (TG34.1)
9th TAF

TAB A EXTRACT OF CORPS OPORD 16.

1. SITUATION

a. * * * * *
b. * * * * *
c. * * * * *

2. MISSION

2d Corps attacks 240830 May; secures crossings over the GRUNIG River; prepares to destroy enemy in zone.

3. EXECUTION

a. Concept of operation. Annex C, Operations Overlay.

(1) Maneuver. Operation to be conducted in three phases as follows:

(a) Phase I—Corps attacks from present positions, with 1st Inf Div, 10th Mech Div, and 12th Mech Div from north to south, and breaches Aggressor first and second defensive belts. 10th Mech Div makes the corps main attack; 4th Armd Div in corps reserve, follows in zone 10th Mech Div.

(b) Phase II—On breaching the Aggressor second defensive belt, corps exploits to secure crossings over the GRUNIG River. 1st Inf Div continues attack to secure crossings in zone. 4th Armd Div passes through 10th Mech Div, makes corps main attack, and exploits to secure crossings in zone. 10th Mech Div follows and supports 4th Armd Div. 12th Mech Div continues attack to secure crossings in zone. _____ Sep Inf Bde (Mech) becomes corps reserve and follows in zone 1st Inf Div.

(c) Phase III—On securing the crossings, corps continues the attack with three divisions abreast to destroy the enemy in zone.

(2) Fires. A chemical and nuclear preparation will be fired to destroy or neutralize Aggressor principal forward positions and second echelon forces that could jeopardize the attack. A nonnuclear preparation of 30 minutes' duration commencing at H–10 will follow the nuclear preparation and will include additional chemical munitions. Annex D, Fire Support.

(a) Air. Priority of air initially to 10th Mech Div; thereafter, to 4th Armd Div when committed. Appendix 1, Air Fire Support, to Annex D, Fire Support.

(b) Artillery. Priority of nonnuclear fires to 10th Mech Div initially; thereafter, to 4th Armd Div when committed. Appendix 2, Artillery Fire Support, to Annex D, Fire Support.

(c) Chemical. Priority of chemical fires initially to 10th Mech Div; thereafter to 4th Armd Div when committed. Appendix 3, Chemical Fire Support, to Annex D, Fire Support.

(d) Naval Gunfire. Priority of nonnuclear fires during the preparation to 10th Mech Div. Appendix 4, Naval Gunfire Support, to Annex D, Fire Support.

(Classification)

(e) Nuclear. Priority of nuclear fires in sequence to destruction of Aggressor nuclear delivery units and reserve units. Appendix 5, Nuclear Fire Support, to Annex D, Fire Support.

(f) Air Defense Artillery. Priority of protection to 4th Armd Div, Corps Honest John Bn's, and Sergeant Bn. Prepare to protect crossing sites over the GRUNIG River. Appendix 6, Air Defense Artillery Fire Support, to Annex D, Fires Support.

b. 1st Inf Div:

* * * * * * *

APPENDIX E

DIVISION FIRE SUPPORT ANNEX

(Classification)

Annex C (FIRE SUPPORT) to OPORD 25—10th Inf Div (Mech).
Reference: Map Series A551 KOPP; Sheets 278, 279, 308, 309, 338, and 339 (WESTWISE); edition BCA; 1:50,000.
Time Zone Used Throughout the Order: ZULU.

1. SITUATION

a. Enemy Forces.

(1) Annex A (Intelligence to OPORD 25.)

(2) Enemy air capable of 30 bomber and 100 fighterbomber sorties per day in zone of 2d corps.

b. Friendly Forces.

(1) 2nd Corps attacks 240830 May with 1st Inf Div on the east 10th Inf Div (Mech) on the west; secures the north bank of the GRUNIG River, and destroys enemy in zone.

(2) 9th TAF supports 2d corps with allocation of 50 CAS sorties daily for period 240300 to 260300 May. Priority to 10th Inf Div (Mech).

(3) Field Artillery support.

(a) 1–96 FA (Pershing): GS 1st Army; priority of fires to 2d Corps.

(b) 101st FA Gp: GS 2d Corps

(c) 103 FA Gp: GSR 10th Inf Div Arty 4–50 FA (155mm, SP)
2–62 FA (175mm, SP)
2–70 FA (8-in, SP)
3–70 FA (8-in, SP)

(4) Naval support. Fire Support Unit Two (TU 34.1.2) provides spt to 10th Inf Div (Mech).

c. Attachments and Detachments. 10 May task organizations.

Div arty and other fire support elements spt 10th Inf Div (Mech) opns with special and conventional ammunition fires.

2. MISSION

a. Division and other fire support agencies support 10th Inf Div (Mech) with special and conventional field artillery, naval gunfire, and air support. Division attacks 240830 May to sieze objectives on north bank of GRUNIG River and prepare to destroy enemy in zone. A 35-minute combined special and conventional ammunition preparation fire will commence at H–25.

3. EXECUTION

a. Concept of Operation. OPORD 25.

(Classification)

(Classification)

b. Air Support.

(1) General. Aircraft will be required for armed reconnaissance of air routes, combat air patrol, and normal close air support functions.

(2) Allocations.

(a) 2d Corps allocated 250 CAS sorties per day. Priority to 10th Inf Div (Mech).

(b) 10th Inf Div (Mech) allocated 100 sorties per day for planning purposes for period 240300 to 260300 May. Priority to 1st Bde.

(3) Miscellaneous. Appendix 1, Air Fire Support.

c. Field Artillery Support.

(1) General. FA will spt the atk initially with a special and conventional ammunition preparation commencing at H–25.

(2) Organization for Combat.

Div arty
1–2 FA: DS 1st Bde
1–4 FA: DS 2d Bde
1–6 FA: GSR 1–2FA; o/o DS 3d Bde
1–18 FA: GS; o/o GSR 1–6 FA
1–20 FA; GS

(3) Miscellaneous.

(a) Priority of FA fires to 1st Bde initially; o/o priority to 3d Bde when committed.

(b) Maximum ordinate of FA fires in Area BRAVO is 5,000 meters from 240800 to 241200 May.

(c) Priority of position areas.

1. Nuclear firing units.
2. Direct support units.
3. Other.

(d) Appendix 2, Field Artillery Fire Support.

d. Chemical Support.

(1) General. Fire support agencies will employ toxic chemicals on enemy forward defensive positions to assist in the penetration. Tactical air and FA will execute a 5-minute toxic chemical preparation commencing at H–25.

(2) Assignment (240600–260600 May).

Unit	Total GB VX	155–mm How GB VX	8–in How GB VX	HJ GB	M91 GB VX (ripples)	Air GB (bomb)	Air VX (Spray Tank)
10th Inf Div (Mech)	1118/762	800/600	80/40	8	6/6	224	26
1st Bde	634/302	600/300			2/2	32	
2d Bde	634/302	600/300			2/2	32	
3d Bde	534/302	500/300			2/2	32	
Total	2920/1578	2500/1500	80/40	8	12/12	320	26

(3) Miscellaneous.

(a) Weather dissemination per 10th Inf Div (Mech) SOP.

(b) Appendix 3, Chemical Fire Support.

(Classification)

(Classification)

e. Naval Gunfire Support.

(1) General. Naval gunfire ships will fire conventional ammunition preparation from H–15 to H–4.

(2) Allocation of naval gunfire support:

(a) CA 78 (Heavy cruiser) : GS 1st Bde.
(b) CA 73 (Heavy cruiser) : GS 2d Bde.
(c) DD 856 (Destroyer) : DS 1–10 Inf
(d) DD 854 (Destroyer) : DS 1–11 Inf
(e) DD 886 (Destroyer) : DS 1–12 Inf
(f) DD 884 (Destroyer) : DS 1–14 Inf

(3) Miscellaneous.

(a) Trajectory limitations to be announced through fire support coordination channels.

(b) Appendix 4, Naval Gunfire Support.

f. Nuclear Fire Support.

(1) General. Nuclear preparation will be fired from H–25 to H–15.

(2) Assignment (240500–261800 May).

Unit	Total	155-mm/ _KT	8-in/ _KT	HJ _KT	HJ _KT	Air _KT	Air _KT
10th Inf Div (Mech)	12	2	1	1	6	1	1
1st Bde	5	3	1	1			
2d Bde	3	2	1				
3d Bde	2	2	0				
Total	22	9	3	2	6	1	1

(3) Miscellaneous. Appendix 5, Nuclear Fire Support.

g. Coordinating Instructions.

(1) FSCL is RED River eff 240700 May.

(2) Counterbattery status is active. Criteria to be announced.

(3) Maximum ordinate of FA fires and naval gunfire in Area BRAVO from 240800 to 241200 May is 5,000 meters.

(4) Target BF 2003 to be fired by NGF only if not positively destroyed by air or in event air support is not available.

(5) Notification of intent to fire nuclear weapons to Div FSE if effects (except dazzle) will extend beyond brigade boundaries.

(6) On-call VX toxic chemical fires may be used to restrict movement and to interdict routes of enemy movement.

4. SERVICE SUPPORT

a. General, Annex E, Service Support Overlay to OPORD25.

b. Materiel and Services CL V ASR 240600–260600.

(1) 155mm how _____110
(2) 8-in how _____ 60
(3) Other types—no restrictions

c. ASP Locations.

(1) ASP 10, 972651.
(2) ASP 11, 982511.

(Classification)

(Classification)

d. SASP Locations.
(1) SASP 100, 970650.
(2) SASP 110, 981510.

e. Resupply of special ammunition per div SOP.

f. Special ammunition load (SAL).

Unit	Total	HE	155-mm _KT	8-in _KT	8-in _KT	HJ _KT	HJ GB VX (ripples)	Air GB VX (bomb)
1-2 FA	754	0	4	0	0	0	2/2	500/250
1-4 FA	754	0	4	0	0	0	2/2	500/250
1-6 FA	754	0	4	0	0	0	2/2	500/250
1-18 FA	475	0	4	4	2	0	0	
155mm								270/135
8-in								40/20
1-20 FA	19	3		0	0	12	0	4/0
Totla	2756	3	16	4	2	12		1814/905

5. COMMAND AND SIGNAL

a. Signal
(1) Index 1-66, CEOI, eff 232400 May.
(2) Airborne close air support coordinator's call sign is THUNDER 12.
(3) Code word for cancellation of nuclear strike is CANCELED followed by nuclear target number.
(4) Annex F (Communications/Electronics) to OPORD 25

b. Command.
(1) FSE located at div CP.
(2) Div arty CP, 8633.

Acknowledge.

NICHOLS
MG

OFFICIAL:

/s/ OWENS
OWENS
G3

Appendixes: 1—Air Fire Support
2—Field Artillery Fire Support
3—Chemical Fire Support
4—Naval Gunfire Support
5—Nuclear Fire Support
6—Illumination Support (omitted)

Distribution: A
Naval Fire Support Unit Two (TU 34.1.2)
9th TAF

(Classification)

APPENDIX F

AIR FIRE SUPPORT APPENDIX

(Classification)

Appendix 1 (Air Fire Support) to Annex C (Fire Support) to OPORD 25–10th Inf Div (Mech)

Reference: Map Series A551 KOPP Sheets 278, 279, 308, 309, 338, and 339 (WESTWISE); edition BCA; 1:50,000.

Time Zone Used Throughout the Order: ZULU.

1. GENERAL

Available air support will neutralize enemy reserves, artillery, and defensive positions; provide close air support for helicopter operations; and conduct armed reconnaissance of air routes RED, WHITE, and BLUE.

2. ALLOCATIONS

a. Estimated 100 sorties available.

b. Four aircraft available for combat air patrol for helicopter-landing (1–35 Inf) for 4-hour period commencing 240800 May.

c. Air Force personnel allocation (TACP).

(1) Division—One.

(2) Brigades—One each.

(3) Maneuver battalions—One each.

(4) Airborne close air support coordinator available through TASE during period of air-landed operations (Call sign Thunder 12.)

3. MISCELLANEOUS

a. Coordinating instructions

(1) FSCL is RED River eff 240700 May.

(2) All returning aircraft will use reconnaissance routes RED, WHITE, and BLUE.

b. Air safety.

(1) Current aircraft identification system in effect.

(2) Maximum ordinate of FA fires is 5,000 meters in Area BRAVO from 240800 May to 241200 May.

c. Chemical fires. Appendix 3, Chemical Fire Support.

d. DASC located at corps CP.

Acknowledge.

(Classification)

(Classification)

BRUEMMER
MG

OFFICIAL:
/s/ Cochrane
COCHRANE
G3

Tabs: A—Preplanned Close Air Support Missions

B—Target Overlay

Distribution: A
9th TAF

(Classification)

Tab A (Preplanned Close Air Support Mission) to Appendix 1
(Air Fire Support) to Annex C (Fire Support) to OPORD 25–10th Inf Div (Mech)

Reference: Map, WESTWISE, 1:50,000, Sheets 278, 279, 308, 309, 338, and 339.

Sheet 1 of 1

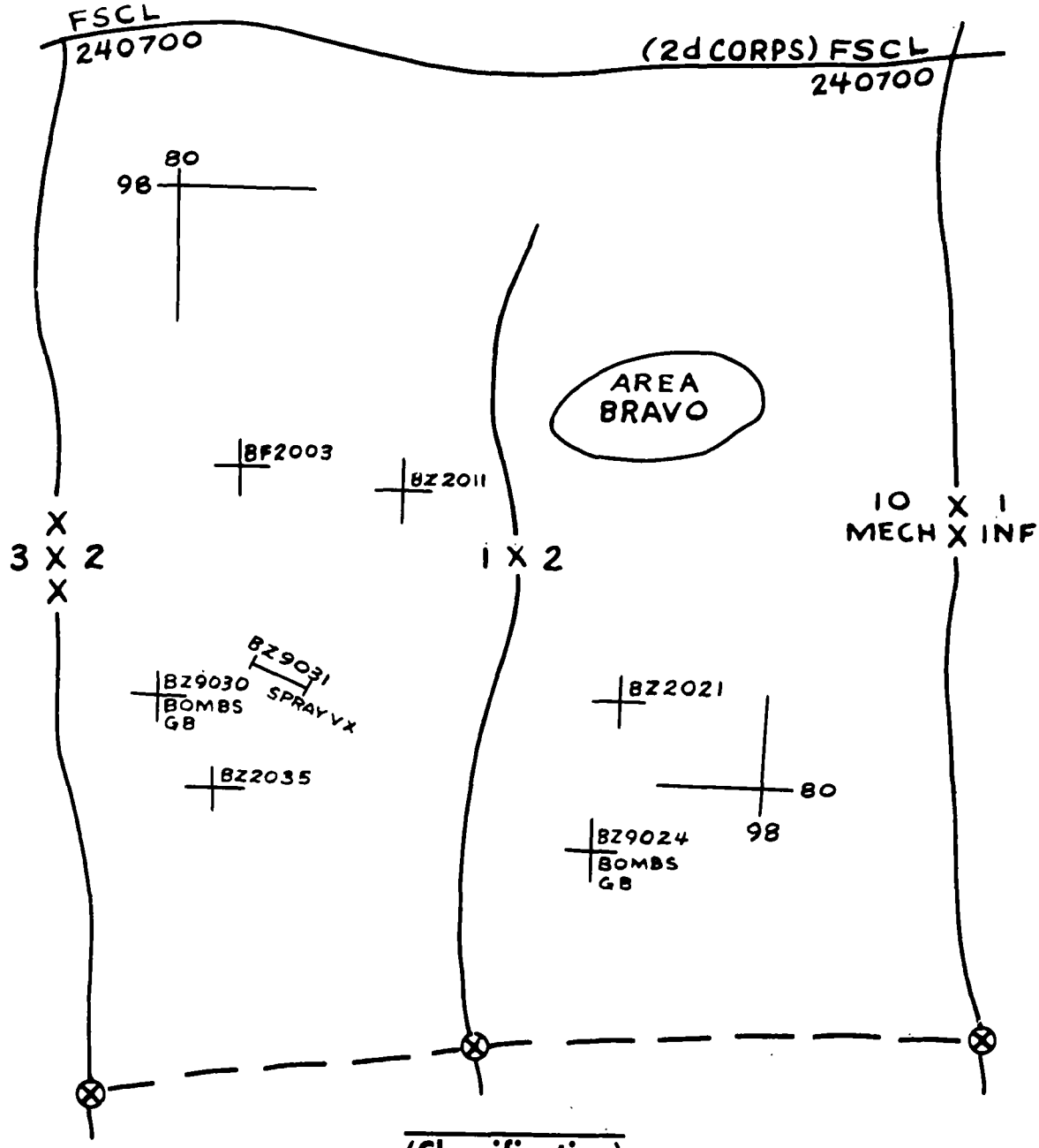
(a) Ln no.	(a) Target number	(b) Ground mission number	(c) Description	(d) Location	(e) Size L	(e) Size W	(f) Aptitude (degrees)	(g) Sorties and armament	(h) TOT	(i) Control	(j) Remarks and/or results desired
1	BF2003	10–04–24	Tunnel entrance	822893	20		135	4 acft, load 1	H–15	Req FL control	Destroy. Req spot report.
2	BZ2021	10–05–24	Inf company	865888	400	200	105	4 acft, load 5	H–1	Req FL control	Neutralize. Req spot report.
3	BZ2011	10–06–24	Tk company	930820	500	400	35	3 acft, load 5	H–15	Req FL control	Neutralize. Req spot report.
*		*	*		*		*	*			*
8	BZ2035	10–11–24	Concrete bridge	806795			75	4 acft, load 1	On call	TBA	Destroy.
9	BZ9029	10–12–24	Sus assy area	930780	1200			3 acft, load 10	On call	TBA	Neutralize. Arty will mark.
10	BZ9030	10–13–24	Sus assy area	796822	1200			3 acft, load 10	On call	TBA	Neutralize.
11	BZ9031	10–14–24	Sus assy area	815819	2300	500	105	2 acft, spray VX	On call	TBA	Contaminate entire area.

(Classification)

COPY NO 2
SHEET 1 OF 1

TAB B (TARGET OVERLAY NO 1) TO APPENDIX 1 (AIR FIRE SUPPORT) TO ANNEX C (FIRE SUPPORT) TO OPORD 25-10th INF DIV (MECH)

REFERENCE: MAP, WESTWISE 1:50,000, SHEETS 278, 279, 308, 309, 338, AND 339.



(Classification)

APPENDIX G

FIELD ARTILLERY FIRE SUPPORT APPENDIX

(Classification)

Appendix 2 (Field Artillery Fire Support) to Annex C (Fire Support) to OPORD 25–10th Inf Div (Mech)
Reference: Map Series A551 KOPP, Sheets 278, 279, 308, 309, 338, and 339 (WESTWISE); edition BCA; 1:50,000
Time Zone Used Throughout the Order: ZULU

1. The 35-minute combined special and conventional ammunition preparation fire will commence at H–25.

2. ORGANIZATION FOR COMBAT
   1–2 FA: DS 1st Bde
   1–4 FA: DS 2d Bde
   1–6 FA: GSR 1–2 FA: o/o DS 3d Bde
   1–18 FA: GS: o/o GSR 1–6 FA
   1–20 FA: GS

3. ASR (240500–261800 May)...
   155-mm How ---------110
   8-in how ---------- 60
   Other types; no restrictions.

4. SPECIAL AMMUNITION

   a. Assignment. Honest John, six rounds (M57).

   b. SAL. Honest John, three rounds (M57).

5. Priority of fires to 1st Bde initially; o/o priority to 3d Bde.

6. The counterbattery status in active.

7. NFL is indicated in Tab B. All changes must be disseminated immediately.

8. Enemy observation posts will be attacked by a mixture of smoke and HE.

9. Maximum ordinate of FA fires in Area BRAVO is 5,000

9. Maximum ordinate of FA fires in Area BRAVO is 5,000 meters from 240800 to 241200 May.

10. ASP LOCATIONS.

   a. ASP 10, 972651.

   b. ASP 11, 982511.

(Classification)

(Classification)

Acknowledge.

WILLIAMS
MG

OFFICIAL:

/s/ Banks
BANKS
G3
Tabs: A—Target List
B—Target Overlay
C—Artillery Fire Support Table (preps)
D—Artillery Fire Support Table (Groups)

Distribution: A

(Classification)

(Classification)

Tab A (Target List) to Appendix 2 (Field Artillery Fire Support) to Annex C (Fire Support) to OPORD 25-10th Inf Div (Mech)

Reference: Map, WESTWISE, 1:50,000, Sheets 278, 279, 308, 309, 338 and 339.

Ln no	(a) Target number	(b) Description	(c) Location	(d) Altitude	(e) Size L	(e) Size W	(f) Attitude (Mils)	(g) Source a/o accuracy	(h) Remarks	Prep	Gp
1	BY8002	2 100-mm guns	88077616	481	100	50	1600	PI-100	Scd	X	
2	BY8003	Unk no 152-mm guns-how	90547523	398				PW-150	Scd	X	
3	BY8004	3 152-mm guns-how	91017703	345	200	150	1150	PI-100	Scd	X	
4	BY8005	Unk no 203-mm guns-how	89647987	378				RR-50	Scd, B1Y	X	X
5	BY8006	2 140-mm rkt lchr	84167593	337	225	125	1200	PI-100	Scd	X	
6	BY8007	Unk no 210-mm rkt lchr	84287833	402				PW-150	Scd	X	
7	BY8008	Unk no medium guns-how	89207078	365				Z(g)-100	Scd, B1y	X	X
8	BY8009	Unk no 203-mm guns-how	80037650	393				RR-50	Scd, B2Y	X	X
9	BY8010	Unk no 203-mm guns-how	80567725	351				RR-50	Scd, B2Y	X	X

(Classification)

(Classification)

Sheet 4 of 4

Ln no.	(a) Target number	(b) Description	(c) Location	(d) Altitude	(e) Size		(f) Attitude	(g) Source a/o accuracy	(h) Remarks	Prep	Gp
*	*	*	*	*				*	*		
*	*	*	*	*				*	*		
*	*	*	*	*				*	*		
50	BF1123	Def pos	98657518	398	325	250	950	PI-100	Scd	X	
*	*	*	*	*				*	*		
53	BG2053	Def pos	97538119	391	350	300	725	PI-100	Scd	X	
54	BZ9029	Sus assy area	930780	375	1200				On call mark w/WP		

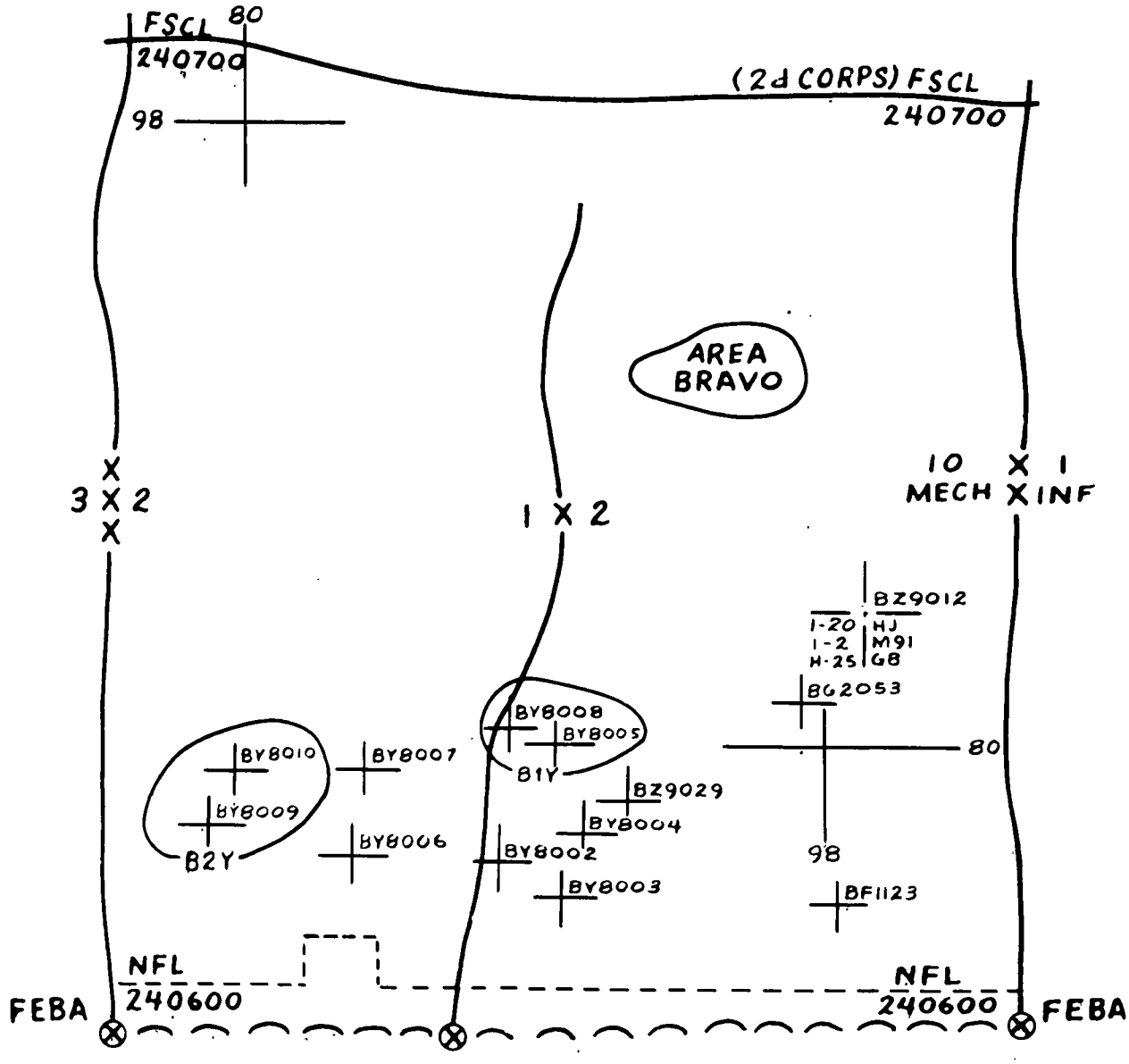
(Classification)

(Classification)

COPY NO 1
SHEET 1 OF 1

TAB B (TARGET OVERLAY) TO APPENDIX 2 (FIELD ARTILLERY FIRE SUPPORT) TO ANNEX C (FIRE SUPPORT) TO OPORD 25-10th INF DIV (MECH)

REFERENCE: MAP, WESTWISE 1:50,000, SHEETS 278, 279, 308, 309, 338, AND 339.



(Classification)

(Classification)

Tab C (Field Artillery Fire Support Table No 1) to Appendix 2
(Field Artillery Fire Support) to Annex C (Fire Support) to OPORD 25

PREPARATION FIRE

Line no	Organization or formation	Firing unit	Scheduled targets	On-call targets	Remarks
1	1-2	A	BZ 9012 (a)		(a) TOT H-25 M91 2 ripples GB
*		*	*	*	
6	1-6	A	BY8007 24 / BY8005 24 / BF1121 72 / BY8002 24 / BF1123 72 72		
7	1-6	B	BY8007 24 / BY8005 24 / BF1121 72 / BY8002 24 / BF1123 72		
8	1-6	C	BY8007 24 / BY8001 18 / BF1121 72 / BY8007 12 / BF1123 72		
9	1-18	A	BZ9012 18 (b) / BY8009 24 / BY8008 24 / BG2052 60 / BY8004 42 / BG2053 60		(b) TOT H-15
10	1-18	B	BZ9012 18 (b) / BY8009 24 / BY8008 24 / BG2052 60 / BY8004 42 / BG2053 60	BZ9029 (c)	(c) 2 rounds WP
11	1-18	C	BZ9012 18 (b) / BY8009 24 / BY8008 24 / BG2052 60 / BY8006 42 / BG2053 60		
12	1-18	D	BZ9012 18 (b) / BY8009 24 / BY8003 9 / BG2052 15 / BY8006 15 / BG2053 15		

(Classification)

Tab D (Field Artillery Fire Support Table No 2) to Appendix 2
(Field Artillery Fire Support) to Annex C (Fire Support) to OPORD 25-10th Inf Div (Mech)

GROUPS OF TARGETS

Sheet 1 of 1

Line no	(a) Organization or formation	(b) Firing unit	(c) B1Y		B2Y									(d) On-call targets	(e) Remarks
1	1-6	A	BY8005 18												
2	1-6	B	BY8005 18												
3	1-6	C													
4	1-18	A	BY8008 18		BY8009 18										
5	1-18	B	BY8008 18		BY8009 18										
6	1-18	C			BY8010 18										
7	1-18	D			BY8010 18										

(Classification)

APPENDIX H

CHEMICAL FIRE SUPPORT APPENDIX

(Classification)

Appendix 3, (Chemical Fire Support) to Annex C (Fire Support) to OPORD 25–10th Inf Div (Mech)

Reference: Map Series A551 KOPP, Sheets 278, 279, 308, 309, 338, and 339 (WESTWISE); edition, BCA; 1: 50,000

Time Zone Used Throughout the Order: ZULU

1. SITUATION

a. Enemy forces. Annex A Intelligence to OPORD 25.

b. Friendly forces. Annex C Fire Support to OPORD 25.

2. MISSION

Fire support agencies will employ toxic chemicals on enemy forward defensive positions to assist in the penetration.

3. EXECUTION

a. Concept of chemical support.

(1) A 5-minute toxic chemical preparation will be provided from H–25 to H–20.

(2) On-call VX chemicals will be used to restrict movement and to interdict routes of enemy movement.

b. Assignment: (240600–260600 May).

Ln No.	Column									
	1	2	3	4	5	6	7	8	9	10
	System	155-mm how		8-in how		HJ	M91 ripples		Air Bomb	Air Spray
	Weapon	GB	VX	GB	VX	GB	GB	VX	GB	VX
A	10th Inf Div (Mech)	800	600	80	40	8	6	6	224	26
B	1st Bde	600	300				2	2	32	
C	2d Bde	600	300				2	2	32	
D	3d Bde	500	300				2	2	32	
	Total	2500	1500	80	40	8	12	12	320	26

c. Units to participate in toxic chemical operations. See tab A.

(Classification)

(Classification)

d. Coordinating instructions.

(1) Weather.

(a) Wind speed and direction, 4mph, SW.

(b) Average temperature, 50°F.

(c) Conditions favor our use of toxic chemicals.

(2) Troops entering toxic impact areas will be masked initially.

4. SERVICE SUPPORT

a. General. Annex E, Service Support Overlay to OPORD 25.

b. Materiel and Services.

(1) Chemical Ammunition Lvad
(Table Below)

Ln No.	Column 1	2	3	4	5	6	7	8
	System Weapon	155-mm how GB	155-mm how VX	8-in how GB	8-in how VX	HJ GB	M91 ripples GB	M91 ripples VX
A	1-2 FA	500	250				2	2
B	1-4 FA	500	250				2	2
C	1-6 FA	500	250				2	2
D	1-18 FA	270	135	40	20			
E	1-20 FA					4		
Total in div dior units		1770	885	40	20	4	6	6

(2) ASP locations.

(a) ASP 100, 970650.

(b) ASP 110, 981510.

5. COMMAND AND SIGNAL

Annex F, Communications-Electronics to OPORD 25.

Acknowledge.

SODERSTROM
MG

OFFICIAL:

/s/ Schwartz
SCHWARTZ
G3

Tabs: A—Fire Support Table/Target List
B—Target Overlay

Distribution: A

Tabs: A—Fire Support Table/Target List
B—Target Overlay

Distribution: A
9th TAF

(Classification)

(Classification)

Tab A (Chemical Fire Support Table/Target List) to Appendix 4
(Chemical Fire Support) to Annex C (Fire Support) to OPORD 25-10th Inf Div (Mech)
Reference: Map, WESTWISE, 1:50,000, Sheets 278, 279, 308, 309, 338, and 339.

Ln no	(a) Target number	(b) Description	(c) Location/ DGZ	(d) Altitude	(e) Size L	(e) Size W	(f) Altitude (Mils)	(g) Weapon/ ammunition	(h) TOT	(i) Unit	(j) HOB	(k) Remarks and/or results desired
1	BF9001	Inf assy area	818799	300	3300	1800	750	2 sorties, 12 bombs, GB	H-25	9 TAF		Immediate casualties
2	BZ9012	Def position	980830	415	2400	600	2100	2 HJ, GB 3 M91, GB	H-25	1-20 FA 1-2 FA		Immediate casualties
3	BZ9013	Def position	948847	260	600	400	1650	2 sorties, 16 bombs, GB	On call	9 TAF		Immediate casualties
*		*	*	*				*	*			*
8	BZ9028	Def position	918420	280	700	400	2200	1 HJ, GB	On call	1-20 FA		Immediate casualties
9	BZ9029	Sus assy area	930820	320	1200	800		3 sorties, 48 bombs, GB	On call	9 TAF		Immediate casualties
10	BZ9030	Sus assy area	796822	290	1200	1000		3 sorties, 48 bombs, GB	On call	9 TAF		Immediate casualties
11	BZ9031	Sus assy area	815819	305	2300	500	1850	2 sorties, spray VX	On call	9 TAF		Contaminate entire area.

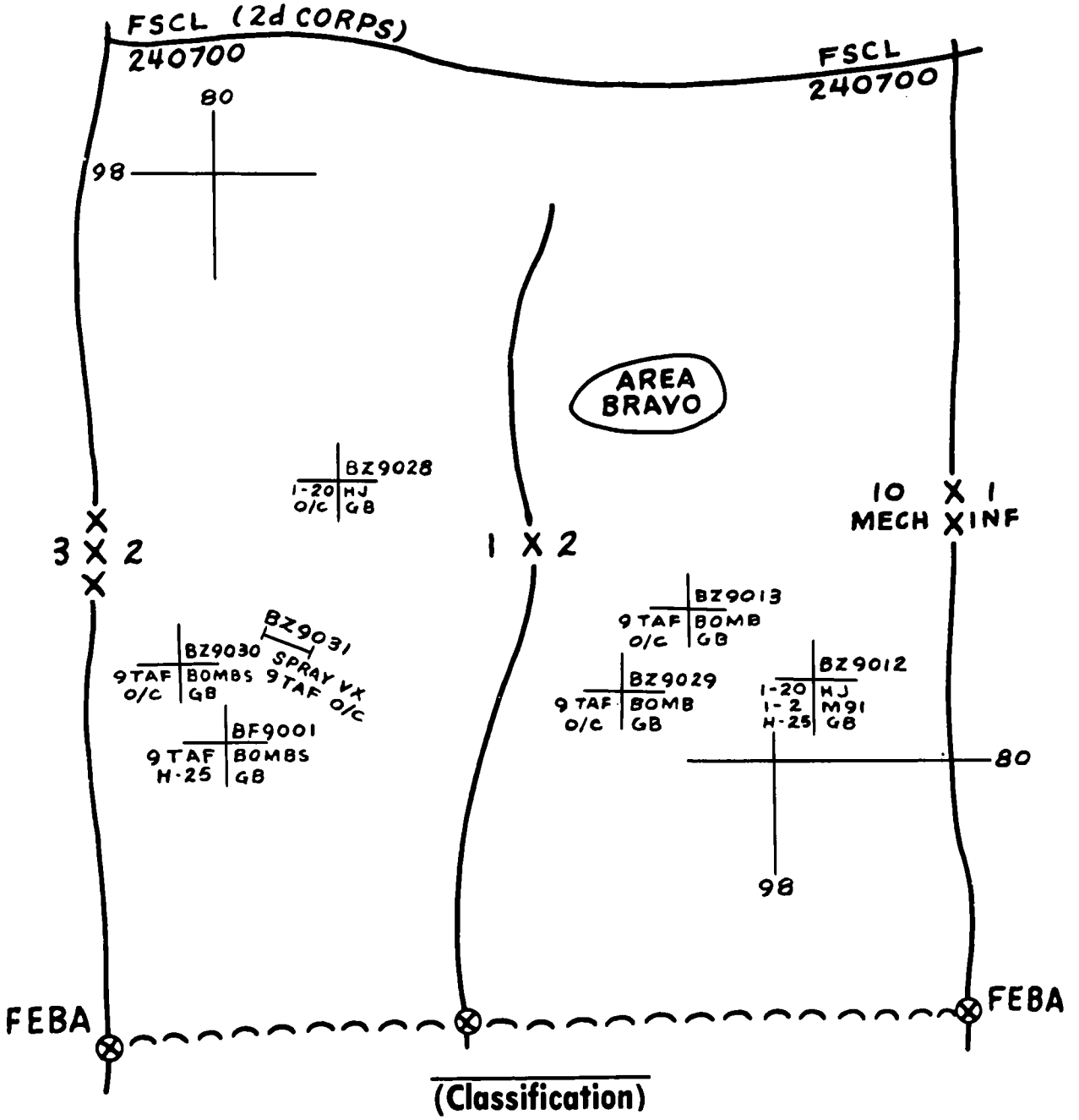
(Classification)

(Classification)

COPY NO 2
SHEET 1 OF 1

TAB B (TARGET OVERLAY) TO APPENDIX 4 (CHEMICAL FIRE SUPPORT) TO ANNEX C (FIRE SUPPORT) TO OPORD 25

REFERENCE: MAP, WESTWISE 1:50,000, SHEETS 278, 279, 308, 309, 338, AND 339.



(Classification)

APPENDIX I

NAVAL GUNFIRE SUPPORT APPENDIX

(Classification)

Copy No 2
10th Inf Div (Mech)
BREMERHAVEN (8835), GERMANY
Copy No 2
10th Inf Div (Mech)
BREMERHAVEN (8835), GERMANY
232330Z May 19__
232330Z May 19__
CW 330

Appendix 4 (Naval Gunfire Support) to Annex C (Fire Support) to OPORD 25-10th Inf Div (Mech)
Reference: Map, Series A551 KOPP, Sheets 278, 279, 308, 309, 338, and 339 (WESTWISE); edition BCA; 1:50,000
Time Zone Used Throughout the Order: ZULU

1. See Target Overlay No 1 for fire support areas (FSA), zone of fire (ZF), no-fire line (NFL), and naval gunfire (NGF) targets.

2. On-call neutralization fires will be observed and adjusted whenever possible.

3. TOT'S fired by NGF ships and FA units will be coordinated through the FSCC/FSE and other appropriate supporting arms control agencies.

4. Air target BF 2003 is duplicated within capability of NGF support means. To be fired only if not positively destroyed by air attack or in the event air support is not available.

5. FA FO'S will request NGF missions through FSCC of supported maneuver battalion by most expeditious communication means. NGF liaison officer and spotters will be prepared to relay such requests.

6. Trajectory limitations will be announced through FSCC channels.
Acknowledge.

DELANEY
MG

OFFICIAL:
/s/ Clancy
CLANCY
G3

Tabs: A—Target List
B—Target Overlay
C—Naval Gunfire Fire Support Table (Preparation)

Distribution: A
Naval Fire Support Unit Two (TU 34.1.2)

(Classification)

(Classification)

Tab A (Target List No 1) to Appendix 5 (Naval Gunfire Support) to Annex C (Fire Support) to OPORD 25-10th Inf Div (Mech)
Reference: Map, WESTWISE,1:50,000, Sheets 278, 279, 308, 309, 338, and 339.

Sheet 1 of 1

Ln no	(a) Target number	(b) Description	(c) Location	(d) Altitude	(e) L	Size W	(f) Altitude (Mils)	(g) Source a/o accuracy	(h) Remarks	Prep	GP	
1	BF1203 (ZR 7)	Tunnel ent	822893	150	20				Airstrike H-20			
2	BF1220 (ZR 4)	Plt def pos	851805	170	80			PI		X		
3	BF1221 (ZR 7)	Tk assy area	824875	140	200			AO, PI		X		
*	*	*		*			*	*	*			
8	BF1226 (ZR 1)	Plt def pos	816881	180	125			Patrol		X		
9	BF1227 (ZR 7)	Lt acft landing fld	876848	120	900	50	0400	AO, PI 50				
10	BF1228 (ZR 7)	Regt CP	836835	250	250			PW		X		
*	*	*		*			*	*	*			
25	BF1201 (ZR 3)	ASP	894790	205	200	150	100	AOP, PI		X		
26	BG1202 (ZR 4)	Co (-) def pos	993795	100	200	100	1850	AOP		X		
27	BG1203 (ZR 3)	Def pos	889802	170	250	150	1400	PI		X		
28	BG1204 (ZR 3)	Tk assy area	906787	180	400	300	1750	AO		X		
*	*	*		*			*	*	*			
48	BG1217 (ZR 8)	Sus CP	937822	150	100			PI		X		
49	BG1218 (ZR 8)	Res assy	948812	160	200			AO		X		
50	BG1219 (ZR 8)	Earth bunkers	920810	200	150	100	1600	PI		X		

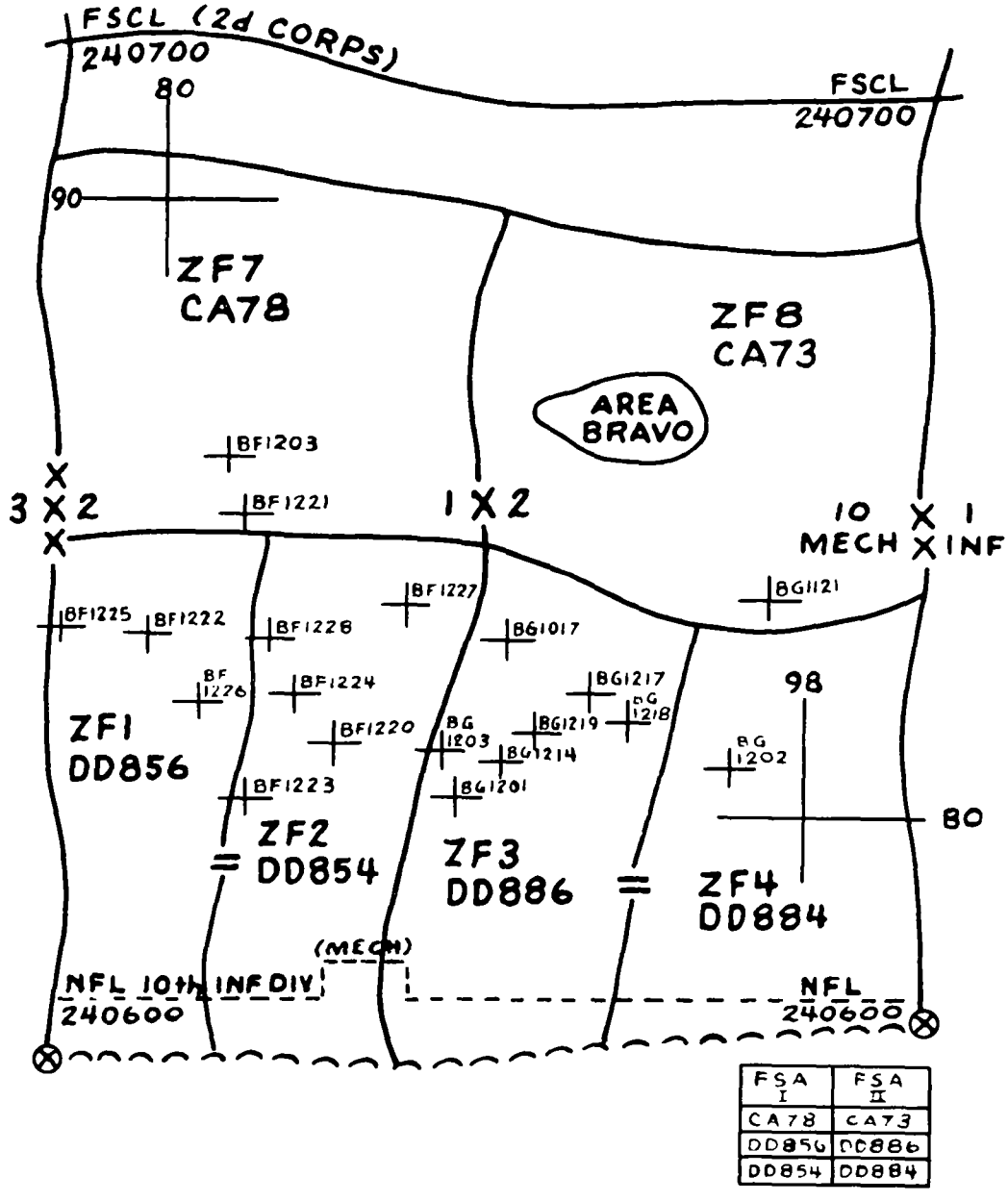
(Classification)

(Classification)

COPY NO 1
SHEET 1 OF 1

TAB B (TARGET OVERLAY) TO APPENDIX 5 (NAVAL GUNFIRE SUPPORT) TO ANNEX C (FIRE SUPPORT) TO OPORD 25-10th INF DIV (MECH)

REFERENCE: MAP, WESTWISE 1:50,000, SHEETS 278, 279, 308, 309, 338, AND 339.



FSA I	FSA II
CA78	CA73
DD856	DD886
DD854	DD884

(Classification)

Tab C (Naval Gunfire Support Table) to Appendix 5
(Naval Gunfire Support) to Annex C (Fire Support) to OPORD 25-10th Inf Div (Mech)

PREPARATION FIRE

Line no	(a) Organization or formation	(b) Firing Unit	(c) Scheduled Targets -20	-18	-16	-14	-12	-10	-8	-6	-4	-2	H	2	4	6	(d) On-call target	(e) Remarks
1	CA73 (ZF 8)	8-in	BG1201 18 (a)				BG1203 18 (a)				BG1219 24			BG1218 24 (b)			BG1017, BG1121	(a) Fz mixed (b) Fz mixed air spot
2		5-in			BG1202 24													
3	DD886 (ZF 3)	5-in									BG1203 24							
4	DD884 (ZF 4)	5-in	BG1202 24				BG1204 48 (a)										BG1014	
5	CA78 (ZF 7)	8-in			BF1228 24												BF1203, BF1227	
6		5-in	BF1221 18															
7	DD856 (ZF 1)	5-in	BF1226 24														BF1222(b)	
8	DD854 (ZF 2)	5-in	BF1220 18														BF1224	

APPENDIX J

NUCLEAR FIRE SUPPORT APPENDIX

(Classification)

Copy No 2
10th Inf Div (Mech)
BREMERHAVEN (8835), GERMANY
CW 330

Appendix 6 (Nuclear Fire Support) to Annex C (Fire Support) to OPORD 25–10th Inf Div (Mech)

Reference: Map, Series A551 KOPP, Sheets 278, 279, 308, 309, 338, and 339 (WESTWISE); edition BCA1 1:50,000
Time Zone Used Throughout the Order: ZULU

1. GENERAL.

a. Twenty-two nuclear weapons assigned to 10th Inf Div (Mech) during the operation.

b. Nuclear preparation will be fired from H–25 to H–20.

2. ASSIGNMENT (240500–261800 May).

Unit	Total	155–mm _KT	8–in _KT	8–in _KT	HJ _KT	Air _KT	Air _KT
Div	12	2	1	1	6	1	1
1st Bde	5	3	1	1			
2d Bde	3	2	1				
3d Bde	2	2	0				
Total	22	9	3	2	6	1	1

3. SAL

	Units	Total	155–mm _KT	8–in _KT	8–in _KT	HJ _KT
1–2 FA		4	4			
1–4 FA		4	4			
1–6 FA		4	4			
1–18 FA		10	4	4	2	
1–20 FA		12				12
Total in div divr units		34	16	4	2	12

4. MISCELLANEOUS.

a. Nuclear target numbers allocated 10th Inf Div (Mech).

1st Bde _____GE 0001–GE 0999
2d Bde _____GD 1000–GD 1999

(Classification)

(Classification)

3d Bde _____GC 2000-GC 2999
10th Inf Div _____GG 3000-GG 3999

b. Notification of intent to fire nuclear weapons to Div FSE if effects (except dazzle) will extend beyond Brigade boundaries.

c. Nuclear weapons will not be employed—

(1) Against populated areas of over 2,000 population when the effects will exceed a degree of risk equivalent to moderate risk to warned, exposed personnel.

(2) Against historical edifices, government buildings, and communications facilities without approval of FSE, this HQ.

d. Cancellation of nuclear strike. Notification to div FSE NLT 15 minutes prior to TOT. Code word for cancellation is CANCELED followed by nuclear target number.

e. For air-delivered nuclear strikes, allow 5-minute minimum separation time between multiple flights.

f. Troop safety. SOP.

g. Reports. SOP.

h. SASP locations

(1) SASP 100, 970650.
(2) SASP 110, 981510.

Acknowledge.

EVANS
MG

OFFICIAL:
/s/ Chapman
CHAPMAN
G3

Tabs: A—Nuclear Fire Support Table/Target List
B—Target Overlay

Distribution: A
9th TAF
Naval Fire Support Unit Two (TU 34.1.2)

(Classification)

(Classification)

Tab A (Nuclear Fire Support Table/Target List) to Appendix 6

(Nuclear Fire Support) to Annex C (Fire Support) to OPORD 25-10th Inf Div (Mech)

Reference: Map, WESTWISE,1:50,000, Sheets 278, 279, 308, 309, 338, and 339.

Sheet 1 of 1

Ln no	(a) Target number	(b) Description	(c) Location/ DGZ	(d) Altitude	(e) Size		(f) Attitude (Mils)	(g) Weapon/ mmition	(h) TOT	(i) Unit	(j) HOB	(k) Remarks and/or results desired
1	GG3001	CP complex	95809890	380	400			HJ	H-20	A/1-20	LA	FP2
2	GG3002	Tk co assy area	88908425	320	400			8-in	H-18	D/1-18	LA	Move one how to vic grid 88007300 to fire
3	GG3003	Mech plt	91788225	370	150			8-in	H-16	D/1-18	LA	

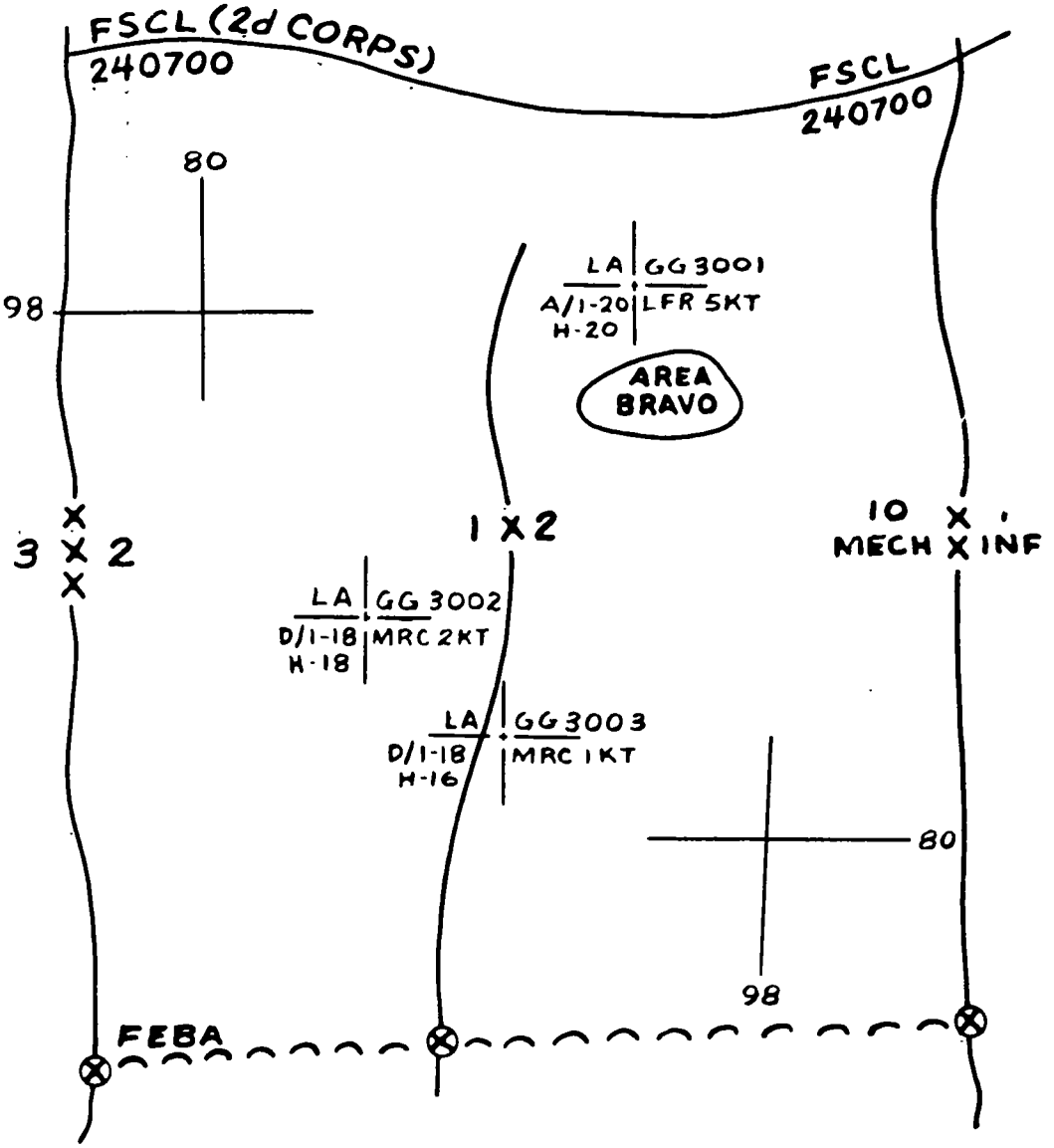
(Classification)

(Classification)

COPY NO 1
SHEET 1 OF 1

TAB B (TARGET OVERLAY) TO APPENDIX 6 (NUCLEAR FIRE SUPPORT) TO ANNEX C (FIRE SUPPORT) TO OPORD 25-10th INF DIV (MECH)

REFERENCE: MAP, WESTWISE 1:50,000, SHEETS 278, 279, 308, 309, 338, AND 339.



(Classification)

APPENDIX K

ILLUMINATION SUPPORT APPENDIX

(Classification)

*Appendix 7 (Illumination Support) to Annex C (Fire Support) to OPORD 25
Reference: Map Series A551 KOPP, Sheets 278, 279, 308, 309, 338 and 339 (WESTWISE); edition BCA; 1:50,000

Time Zone Used Throughout the Order: ZULU

1. 10th Inf Div (Mech) will conduct a supported, illuminated night attack commencing 242230 May.

2. Illumination during the preparation will start at H–10 and continue after H-hour. Illumination to be provided by field artillery (Incl searchlight), naval gunfire, and tactical air.

3. ORGANIZATION FOR PREPLANNED ILLUMINATION

a. Searchlight, 1st Plt (Reinf), Btry A (Slt), 37th Arty: DS 10th Inf Div (Mech).

b. Air. 9th TAF: Provide four illumination aircraft (Msn No 10-07–24 and 10–15–24).

c. AF. 1st FA Bn 2d Arty: DS 1st Bde. 1st FA Bn 4th Arty: DS 2d Bde. 1st FA Bn 6th Arty: GSR 1st FA Bn 2d Arty.

d. Naval gunfire. TU 34.1.2: (CA78): GS 10th Inf Div (Mech).

4. 1st Plat (Reinf), Btry A (Slt), 37th Arty, be prepared to provide illumination on other targets as directed; LDC to be established at FDC, 1st FA Bn 2d Arty.

5. All fire support agencies be prepared to furnish additional illumination on order.

6. Illumination ASR for period 241200–251200 May. 155-mm how—20.

7. Weather forecast disseminated per division SOP.

Acknowledge.

SEALS

(Classification)

* This appendix was not a part of the original Fire Support Annex.

(Classification)

OFFICIAL:
/s/ Looney
LOONEY
G3

Tabs: A—Target List
B—Target Overlay
C—Illumination Support Table

Distribution: A
9th TAF
Naval Fire Support Unit Two (TU 34.1.2)

(Classification)

Tab A (Target List) to Appendix 7 (Illumination Support)
to Annex C (Fire Support) to OPORD 25-10th Inf Div (Mech)
Reference: Map, WESTWISE, 1:50,000, Sheets 278, 279, 308, 309, 338, and 339.

Sheet 1 of 1

Ln no	(a) Target number	(b) Description	(c) Location	(d) Altitude	(e) Size (diameter)	(f) Attitude (Mils)	(g) Source a/o accuracy	(h) Remarks	Prep	On a11
1	BF1288	Regimental CP	836835	180	500		PW	NGF, one gun	X	
2	BY1006	Defensive position	822731	415	1000		PI	Slt, full-beam spread, indirect, visible illum	X	
3	BY1007	Defensive position	838763	402	1000		PW	Slt, full-beam spread, indirect, visible illum	X	
4	BY1008	Defensive position	853760	389	300		PI	Slt, pencil beam, indirect, visible illum	X	
5	BZ1001	Suspect CP	770749	375	500		PI	Slt, full-beam spread, direct, visible illum	X	
6	BZ1002	Suspect CP	805761	380	500		PI	Slt, pencil beam, direct, visible illum	X	
7	BZ1003	Suspect CP	955756	382	100		AO	Slt, pencil beam, direct, visible illum	X	
8	BZ1004	Road junction	820809	337	300		PI	FA, two-weapon spread		X
9	BZ1005	Avenue of approach	843788	378	1500		PI	FA, four-weapon spread		X
10	BZ2021	Tank company assembly area	930820	180	500		AO	TAF, MK 24 flare		X
11	BZ1029	Suspect assembly area	930780	375	2400		PW	TAF, MK 24 flare		X
	*	*	*		*	*	*	*		

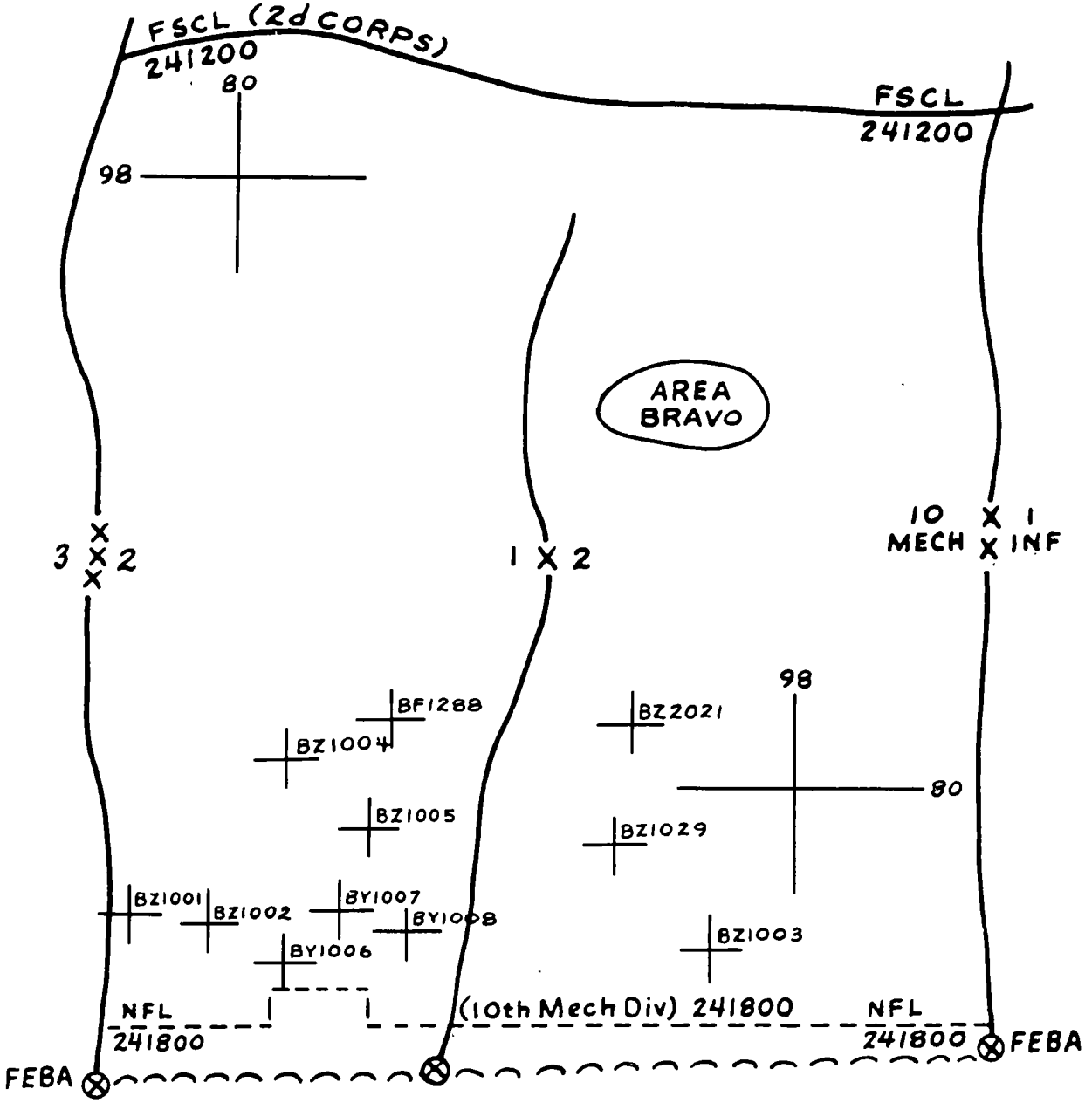
(Classification)

(Classification)

COPY NO 1
SHEET 1 OF 1

TAB B (TARGET OVERLAY) TO APPENDIX 7 (ILLUMINATION SUPPORT) TO ANNEX C (FIRE SUPPORT) TO OPORD 25-10th INF DIV (MECH)

REFERENCE: MAP, WESTWISE 1:50,000, SHEETS 278, 279, 308, 309, 338, AND 339.



(Classification)

(Classification)

Tab C (Illumination Support Table) to Appendix 7
(Illumination Support) to Annex C (Fire Support) to OPORD 25-10th Inf Div (Mech)
Reference: Map, WESTWISE, 1:50,000, Sheets 278, 279, 308, 309,338 and 339.

Sheet 1 of 1

Line no	(a) Organization or formation	(b)	(c) Scheduled targets	(d) On-call targets	Remarks
1	1st Plt (Reinf)	1-1	BZ1001 — 22 minutes (visible illum)		Be prepared to continue illum beyond
2	Btry A (Slt)	1-2	BY1006 — 20 minutes (visible illum)		cut time shown
3	37th FA	1-3	BZ1003 — 26 minutes (visible illum)		
4		1-4	BZ1002 — 26 minutes (visible illum)		
5		1-5	BY1007 — 25 minutes (visible illum)		
6		1-6	BY1008 — 25 minutes (visible illum)		
7	TG 27.6		BR1288 — 8 minutes		One weapon

APPENDIX L

FIELD ARTILLERY QUICK FIRE SUPPORT PLAN

(Classification)

Quick Artillery Fire Support Plan_____Originator: 1st FA Bn 2d Arty Support unit: 1st Bn, 36th Inf H-hour 240930

Sheet 1 of 1 240900 May 19___

		Target Information			Schedule			
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	
Line no	Target number	Grid/description	Remarks	Organization or formation	Firing unit	Scheduled targets -15 -10 -5 H 5 10	Remarks	Line no
1	AA0052	81377611/Plt strong point	Scd	1-2	A	AA0052 26; AF2095 48		1
2	AF2076	81267716/Co assy area	Scd	1-2	B	AF2080 30; AF2077 30(a)	(a) VT	2
3	AF2087	82787719/Plt strong point	Scd	1-2	C	AF2078 24; AF2070 48		3
4	AF2078	82657735/AT wpn	Scd	1-36	4.2 plt	AF2081 80		4
5	AF2079	82417746/Co assy area	Scd					5
6	AF2080	83527810/Plt strong point	Scd					6
7	AF2081	81537825	Scd					7
8	AF2082	83467946	(WP & HE)				On-call	8
9								9
0								0

(Classification)

APPENDIX M

SMOKE SUPPORT APPENDIX

(Classification)

Appendix 5 (Smoke Support) to Annex B (Fire Support) to OPORD 26__ 10th Inf Div (Mech)

Reference: Map, Series A551 KOPP, Sheets 278, 279, 308, 309, 338, and 339 (WESTWISE); edition BCA; 1:50,000
Time Zone Used Throughout the Order: ZULU

1. The 22-minute conventional ammunition preparation fire will commence at H-12.

2. ORGANIZATION FOR COMBAT
   1-4 FA: DS 1st Bde.
   1-6 FA: Reinf 1-4 FA; o/o DS 3d Bde (not to exceed 40 percent HE ASR).

3. ASR (260001-282400 May).

	HE	HC	PWP	WP	TOTAL
155-mm how	110	25	20	30	185

4. Bn S4's will request and draw necessary HC and WP for immediate consumption prior to the preparation fire.

5. The counterbattery status is active.

6. NFL is indicated in tab B. NFL ALFA in effect on-call. All changes must be disseminated immediately.

7. ASP location, 10972651.
Acknowledge.

O'BRIEN
COL

OFFICIAL:
/s/ Kelly
KELLY
G3

Tabs: A—Target List
B—Target Overlay
C—Field Artillery Fire Support Table

Distribution: A
9th TAF

(Classification)

(Classification)

Tab A (Target List) to Appendix 2 (Smoke Support) to
Annex B (Fire Support) to OPORD 26
Reference: Map, WESTWISE, 1:50,000, Sheets 278, 279, 308, 309, 338, and 339.

Ln no	(a) Target number	(b) Description	(c) Location	(d) Altitude	(e) Size L	(e) Size W	(f) Attitude (Mils)	(g) Source and/or accuracy	(h) Remarks	Prep	OCNa 11
1	AG1121	Valley	95497265	380		500	1800		Smoke curtain	X	
2	AG1122	Inf plt strongpoint	96067356	469	325	300	1600	PI-100	Div Arty Scd	X	
3	AG1123	Squad strongpoint	94647410	370	150			PW-150		X	
4	AG1124	OP	92527281	481				AOP-50	Obscuring smoke	X	
5	AG2101	Squad strongpoint	94667273	385	125	100	1400	PI-100		X	
6	AG2102	Two antitank weapons	95477227	437				Patrol-100		X	
7	AG2103	Inf plt dug in	95937205	445	300	100	1650	PI-100		X	
8	AG2104	Two antiaircraft weapons	96757218	451				AOP-50	Smoke haze		X
9	AG3091	Motorized plt assy area	91797343	426		300		PI-100		X	
10	AG3092	Inf plt dug in	91807238	429	150	150		PI-100		X	
11	AG3093	Inf plt dug in	90617259	432	400	200	1500	AOP-50	Obscuring smoke	X	
12	AG3094	Plt strongpoint	01977358	411	90			PI-100	Obscuring smoke	X	
13	AG7061	Antiaircraft weapons	93347411	380		100		PI-100		X	

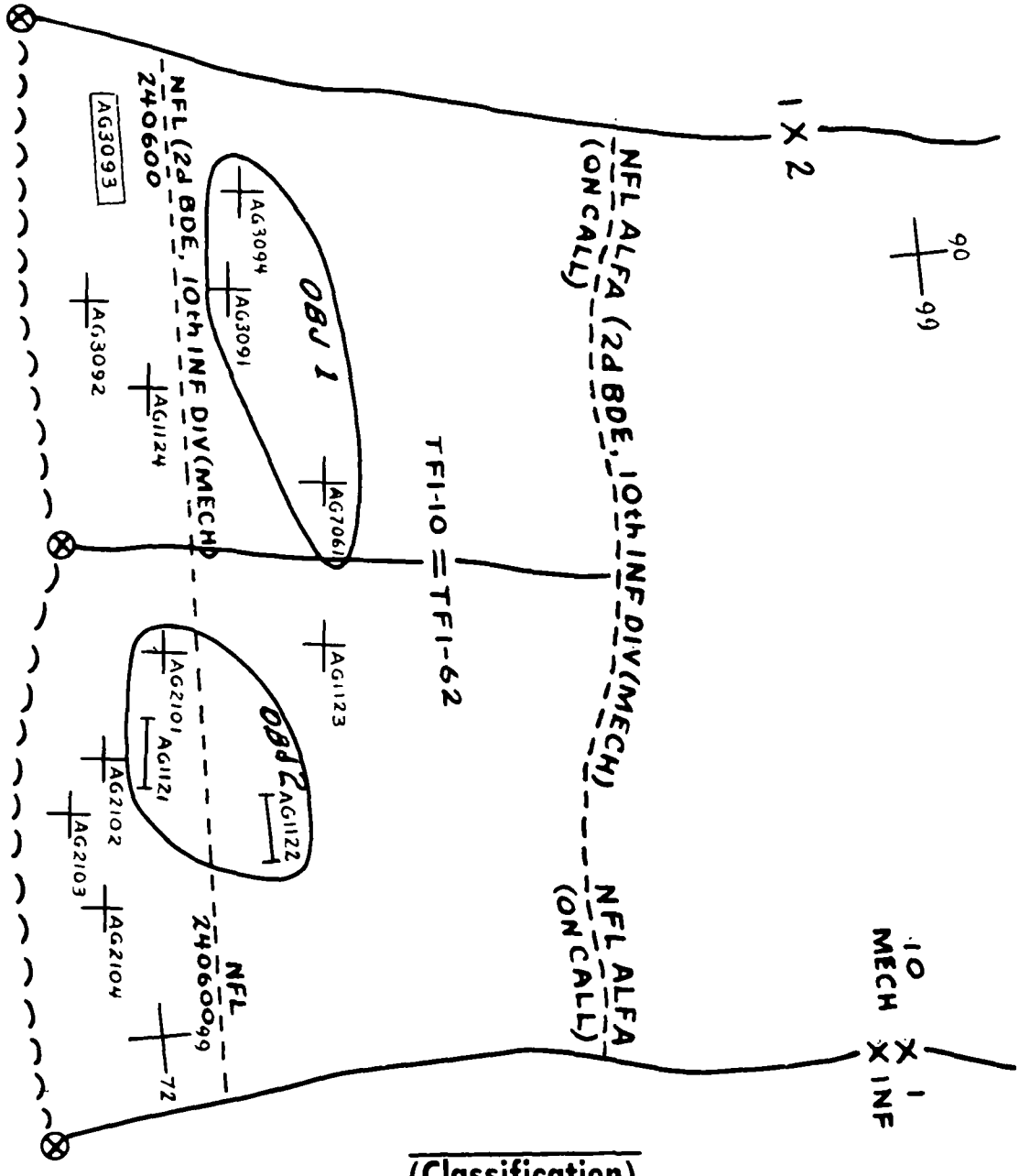
(Classification)

(Classification)

COPY NO 2
SHEET 1 OF 1

TAB B (TARGET OVERLAY) TO APPENDIX 2 (SMOKE SUPPORT) TO ANNEX B (FIRE SUPPORT) TO OPORD 30

REFERENCE: MAP, WESTWISE 1:50,000, SHEETS 278, 279, 308, 309, 338, AND 339.



(Classification)

TAB C (FIELD ARTILLERY FIRE SUPPORT TABLE) to APPENDIX 2

(SMOKE SUPPORT) to ANNEX B (FIRE SUPPORT) to OPORD 30

Sheet No 1 of 1

Line No.	Organization or Formation (a)	Firing Units (b)	PREPARATION FIRE / SCHEDULED TARGETS (c)	On Call Targets (d)	Remarks (e)
	1-4 FA	A	-12: AG2102 18; -8: AG 2103 48; H: AG 2103 24; +6: AG 1121 (d)	AG 2104 (b)	(a) 50% WP - 50% HE
		B	-12: AG2102 18; -8: AG 2103 24; -4: AG 3092 36; +2: AG 3094 30; +6: AG 3094 (c)		(b) HC & PWP (50% MIX) Lift on Call
		C	-8: AG 3091 24; -4: AG 3092 36; +2: AG 3094 30; +6: AG 1123 30		(c) 70% WP 30% HE
	1-6 FA	A	-12: AG7061 18; -8: AG 3091 24; -4: AG 3093 36; +2: AG 3093 (c)		(d) Smoke Curtain 80% HC 20% PWP Lift on Call
		B	-12: AG7061 18; -8: AG 3091 24; -4: AG 3093 36; H: AG 2101 12; +6: AG 1121 d		
		C	-12: AG1124 18(a); -4: AG 1124 (b)		

APPENDIX N

FIRE SUPPORT COORDINATION FORMS

SECTION I. GENERAL

The requirement for rapid decisions in order to effect appropriate fire coordination dictates the need for graphic display of information in the fire support coordination center (FSCC) and/or fire support element (FSE). The specific information required is determined by the fire support coordinator (FSCOORD) operating the FSCC or FSE and is included in the standing operating procedures of the headquarters. In addition to situation maps, fire capabilities overlays, and p'anning maps for future operations, the formats in section II of this appendix serve as ready references for information that is required and used frequently.

SECTION II. EXAMPLE FORMATS

Organization for Combat and Status of Units ---------- N-1
Situation Report ---------- N-2
Call for Fire from Higher Headquarters (Conventional Ammunition) ---------- N-3
Call for Fire from Higher Headquarters (Special Ammunition) ---------- N 4
Fire Mission Report ---------- N-5
Nuclear Target Analysis Format ---------- N-6
Nuclear Fire Mission Summary ---------- N-7
Nuclear Action Form Record ---------- N-8
NBC Report Format ---------- N-9
Tactical Damage Assessment Report ---------- N-10
Assignment Summary (Special Ammunition) ---------- N-11
Distribution Summary (Special Ammunition) ---------- N-12
Daily Air Reconnaissance Plan Workshop ---------- N-13
Transport Helicopter Request Format ---------- N-14
Airlift Request Format ---------- N-15

FORM N-1. ORGANIZATION FOR COMBAT AND STATUS OF UNITS

Unit	Call sign		Present location		Time reported displaced	Proposed location		Time closed	Mission	Active		Readiness	Remarks
	Telephone	Radio	Clear	Coded		Clear	Coded			Tubes	Lchr		
1-3 FA	SMOKER	ARTERY	320561	NA12B	071310	290542	LF16A3		DS 1st Bde	(18)			
A	SMOKER RED	ARTERY	291430	TL67C	070600					6			
B	SMOKER WHITE	ARTERY	250367	MH16O	070900					6			
C	SMOKER BLUE	ARTERY	241478	PN76H	070910					6			
1-10 FA	CONGO	TOPEKA	300310	JO27F	070800				GS	22	4		
101 FA Gp	DAGWOOD	STUCCO	470819	AM27R	061900				GSR; 1st Div Arty	(60)			
2-50 FA	BARREL	TANGO	410620	BX801	070600					18			
3-51 FA	JASON	PENNY	381962	DE10G	061400					18			
4-70 FA	SHAMROCK	CAESAR	320320	CH27A	061500					12			
5-71 FA	PERRY	RUBY	370512	XF98Z	061000					12			
102 FA Gp													
1-50 FA													
2-51 FA													
3-70 FA													
4-71 FA													
3-82 FA												A^1	

Note: Readiness conditions may be established in the standing operating procedures and may be designated as follows:

A^1 - 1-minute notice required for firing.

FORMAT N-2. SITUATION REPORT

1. Unit sending report: _____.
(Radio or telephone call sign)

2. Period covered: From _____ to _____.
(Date and time) (Date and time)

3. Location of forward elements of supported units: _____
_____IN CODE.

4. Location of unit CP and closing time: _____ IN CODE.

a. Locations of battery centers or firing positions for missile units:
(1) _____ (2) _____ (3) _____
(4) _____ IN CODE.

b. Direction of center of zone of fire: (1) _____
(2) _____ (3) _____ (4) _____
IN CODE.

c. Proposed new location and effective time: _____
IN CODE.

5. Location of unit helipad: _____ IN CODE.

6. No-fire line (location and effective time): _____
IN CODE.

7. Number of missions fired: _____ IN CLEAR.

8. Enemy casualties: _____ IN CLEAR.

9. Materiel destroyed: a. Type _____, b. Number
_____ IN CLEAR.

10. Personnel losses: a. KIA _____, b. WIA _____
IN CODE.

11. Ammunition status: (ALL IN CODE)

Type	Rounds on hand	Rounds expended during period
a. HE		
b. Smoke		
c. Other		
d. Total		

12. Shortages of personnel, equipment, fuel, or ammunition that seriously affect unit mission: _____ IN CODE.

13. Combat efficiency as of end of period: _____
IN CODE.

14. Plans for support of future operations and incidents of immediate value. (submit overlay when practicable.) _____
IN CODE.

FORMAT N-3. CALL FOR FIRE FROM HIGHER HEADQUARTERS (CONVENTIONAL AMMUNITION)

The following is a list of the elements in a call for conventional fire from higher headquarters in the sequence in which they are transmitted.

1. Identification _____ THIS IS _____.
2. Warning order/size of unit to fire. FIRE MISSION.
3. Target location:
   a. Target number _____.
   b. Grid _____ altitude _____ meters.
   c. Other _____.
4. Description of target:
   a. Type of engagement _____.
   b. Size _____.
   c. Attitude _____.
   d. Degree of protection _____.
5. Method of engagement: The elements in a through d below are transmitted if they are different from standard.
   a. Type of adjustment _____.
   b. Type of trajectory _____.
   c. Type of ammunition
      (1) Type of shell/fuze _____.
      (2) Volume to be fired _____.
   d. Distribution of fire _____.
6. Method of fire and control: _____.

IMPLEMENTING INSTRUCTIONS

FOR CALLS FOR CONVENTIONAL FIRE FROM HIGHER HEADQUARTERS

A format is required to enable divisional and higher field artillery headquarters to forward calls for conventional fire to field artillery battalions or to an intermediate field artillery headquarters. The format for calls for conventional fire from higher headquarters which is shown below, can be used to request additional fires.

N–1. IDENTIFICATION

The initial element of the message, identification, establishes communication between the higher field artillery headquarters and the fire unit or an intermediate artillery headquarters.

N–2. WARNNG ORDER/SIZE OF UNIT TO FIRE

a. The basic warning order is FIRE MISSION.

b. The second part of this element specifies the size of the fire unit(s) to fire for effect; e.g., BATTERY, BATTALION, ALL AVAILABLE.

N–3. TARGET LOCATION

a. The location of the target is given in one of the following ways:

(1) By target number and known point.
(2) By grid.
(3) By reference from a known point.
(4) By polar coordinates.

b. The target number and known point are mutually known locations. For example:

(1) ZT1242.
(2) AB1014.
(3) REGISTRATION POINT 1.

c. Grid coordinates indicate the easting and northing to the degree of accuracy required by the type of engagement. Normally, the altitude is included in this element. Example: GRID 42137856, ALTITUDE 231.

d. The location of the target is given by reference from a known point, by polar coordinates, or by other means. Examples:

(1) From REGISTRATION POINT 1, DIRECTION 2610, LEFT 600, ADD 400, DOWN 20.

(2) ZT1234, DIRECTION 1200, RIGHT 400, DROP 200, UP 50.

(3) DIRECTION 1240, DISTANCE 2000, UP 25 MILS.

Note. If meters or mils are not specified, elevation is assumed to be in meters.

N–4. DESCRIPTION OF TARGET

The description of the target is as complete as possible and includes all information that may influence the engagement of the target. The following elements are included:

a. The type of target; e.g., BATTALION ASSEMBLY AREA.

b. If the target is rectangular, the length and width are given in meters; e.g., 200 BY 100. When the target is circular, the radius is given.

c. The long axis of a rectangular target is given to DS units to the nearest 50 mils; e.g., ATTITUDE 2500.

d. The description of the target includes the degree of protection of the target; e.g., TROOPS IN TRENCHES.

N–5. METHOD OF ENGAGEMENT

a. The method of engagement is based on the location and nature of the target, the type and quantity of ammunition available, the desired effects on the target, and the weapon system available. The method of engagement includes the following:

(1) Type of adjustment.
(2) Type of trajectory.
(3) Type of ammunition.
(4) Distribution of fire.

b. The type of adjustment indicates any special procedures to be used in the attack of the target. If the type of adjustment is not specified, area fire will be used. Special procedures include:

(1) MARK—Indicates rounds fired to—

(a) Orient the observer in his zone of observation.

(b) Indicate targets to ground troops, aircraft, or fire support ships.

(2) DESTRUCTION—The engagement of a target with the purpose of destroying it.

(3) DANGER CLOSE—When the target is close to friendly troops, the limits and special procedures are designed to insure the safety of the troops.

c. The type of trajectory indicates the use of high-or low-angle fire. Low-angle fire is used unless high-angle fire is specified.

d. The type of ammunition to be used in the engagement is indicated. The volume required may be included.

(1) The type of shell/fuze is indicated if shell HE, fuze quick, which is standard, is not to be used. If the type of ammunition required in adjustment and in fire for effect is different, the

words "in adjustment" and "in effect" are included.

(2) The volume of fire deemed necessary in fire for effect may be specified. The volume of fire serves as a warning for the preparation of a specified quantity or a special type of ammunition.

e. Distribution of fire insures that fire is distributed adequately to cover the target. If distribution of fire is not specified, batteries fire with planes of fire parallel. Orders which may be used include:

(1) CONVERGE—Line of fire and range are concentrated on a point.

(2) CANCEL CONVERGE—Used to cancel CONVERGE.

N-6. METHOD OF FIRE AND CONTROL

Method of control is announced by use of the following terms:

a. FIRE FOR EFFECT.

b. TIME ON TARGET. Expressed in local time as a seven-digit date-time group or as on call; e.g., 091415S.

c ADJUST FIRE.

d. AT MY COMMAND.

Note. When an element of the call for fire is standard, is not known, or is not required, it may be omitted. Designating each element by a number and the supplementary elements by letters facilitates transmission. For example, instead of transmitting the words "degree of protection," only the number/letter combination need be transmitted followed by the appropriate information; for example: 4d, TROOPS IN TRENCHES.

FORM AT N-4. CALL FOR FIRE FROM HIGHER HEADQUARTERS (SPECIAL AMMUNITION)

The following is a list of the elements in a call for special ammunition fire from higher headquarters in the sequence in which they are transmitted:

1. Identification: _____, THIS IS _____.

2. Warning order/firing unit(s): FIRE MISSION _____.
   a. Size of unit to fire _____.
   b. Firing point(s) _____.

3. Target location:
   a. Target number _____.
   b. Grid _____; altitude _____ meters.
   c. Other _____.

4. Description of target:
   a. Type _____.
   b. Size _____.
   c. Attitdue (state unit of measure) _____.
   d. Degree of protection _____.

5. Method of engagement:
   a. Delivery system _____.
   b. Type of ammunition/warhead _____.
   c. Fuze/HOB option _____.
   d. Number of rounds _____.

6. Control:
   a. TOT _____.
   b. Latest TOT _____.
   c. Other _____.

7. Remarks:
Special instruction _____.

FIRE SUPPORT COORDINATION AGENCY ACTION (REVERSE SIDE OF FORM AT N-4)

_____.

Appr/disap _____ by _____. Requested unit notified at _____.

Concurrences: G2(S2) _____ Firing unit notified at _____
G3(S3) _____ Fired at _____
NGF rep _____ Warning: Army avn _____
ALO _____ TAF _____
Cml _____ Troop units _____
Engr _____ Notification higher HQ _____
Aja HQ _____ Request fwd to _____ for action (Higher HQ)

Tactical damage assessment
GZ _____
Yield _____
HOB _____

Remarks _____
_____
_____

Higher HQ
Action taken: Appr _____
Disap _____
Firing unit _____
_____
Fired at _____
_____
_____

IMPLEMENTING INSTRUCTIONS FOR CALLS FOR SPECIAL AMMUNITION FIRE FROM HIGHER HEADQUARTERS

A format is required to enable divisional and higher field artillery headquarters to forward calls for special ammunition fire to delivery units or to an intermediate field artillery headquarters. The format is applicable to cannon, rocket, and missile units that have the capability to deliver special ammunition fire. The format which is shown below, can be used to request additional fires. The reverse side of format N-4 (fire support coordination agency action) is designed to facilitate internal coordination. It is based on the special weapons standing operating procedures and the internal fire support coordination procedures. Some elements are the same in both the call for special ammunition fire and the call for conventional fire. Implementing instructions for these elements can be found by referring to the applicable elements in the implementing instructions for calls for conventional fire.

N-7. IDENTIFICATION

Same as call for conventional fire.

N-8. WARNING ORDER/FIRING UNIT(S)

a. The basic warning order is FIRE MISSION. This element also specifies whether the target is a target of opportunity or a planned target. A code word prescribed at field army or corps level can be used. For example, RED can be used to indicate a call for fire on a target of opportunity and BLUE can be used to indicate a call for fire on a planned target.

b. The second part of this element designates the firing unit(s) to engage the target, e.g., 1-20 FA (HJ). A prearranged code word or the unit's call sign may be used in transmitting this element.

c. Item 2a, size of unit to fire, indicates the number of weapons, launchers or the specific cannon/launcher to be used.

d. Item 2b, firing point(s), indicates the specific firing point(s) to be occupied by the firing unit(s). Designation of the firing point can be by prearranged code, e.g., FOXTROT BRAVO 14, or by coded grid coordinates.

N-9. TARGET LOCATION

Same as in call for conventional fire.

N-10. DESCRIPTION OF TARGET

Same as in call for conventional fire.

N-11. METHOD OF ENGAGEMENT

a. The method of engagement is based on the location and nature of the target, the type and quantity of ammunition available, the desired effects on the target, and the weapon system available. The method of engagement includes the following:

(1) Delivery system.
(2) Type of ammunition/warhead.
(3) Fuze/HOB option.
(4) Number of rounds.

b. Item 5a, delivery system, specifies the weapon system to be used in the engagement; e.g., HONEST JOHN.

c. Item 5b, type of ammunition/warhead, specifies the ammunition and/or warhead to be used in the engagement. Certain delivery systems require both elements; other systems require only one element. Examples:

(1) Item 5b, MGR-1B/M-57-X. This example is for the Honest John system, and it specifies one of the two rocket motors available and the warhead to be used. Further warhead designation may be required.

(2) Item 5b, M-426-X. This example is for an 8-inch howitzer delivering a chemical projectile. The "X" represents a prearranged code used to specify the agent to be delivered.

d. Item 5c, fuze/HOB option, specifies the fuze option and/or HOB option. Fuze and HOB options are contained in appropriate weapon system publications. Fuze/HOB option elements include the following:

(1) HOB in meters (burst in meters above the target).
(2) HIAR.
(3) LOAR.
(4) GND/IMPT.

e. Item 5d, number of rounds, specifies the total number of rounds to be delivered.

N-12. CONTROL

a. Control measures to be implemented are based on the nature of the target and the scheme of maneuver.

b. Control measures include the following:

(1) Item 6a, TOT, is expressed in ZULU time as a date-time group.

(2) Item 6b, latest TOT, is expressed in ZULU time as a date-time group.

(3) Item 6c, other is used to specify other control measures which may be necessary.

N–13. REMARKS

This element provides for special instructions or additional information that is required to supplement the normal information forwarded; e.g., to report time of flight, to report change of status, etc.

FORM N-5. FIRE MISSION REPORT

Tgt no	Unit	Time	Grid	Alt (meters)	Target description	Method of attack	Volleys	Observed by	Rounds fired by type	Observer's report and/or remarks

TARGET NO _____ DTG OF SELECTION _____ METHOD OF WEAPON SELECTION _____ ANALYST _____ TARGET NO _____

WEAPON SYSTEM							
Firing Position							
Yield							
Range							
RD min							
CD 90							
HDB (Option / Meters)	/	/	/	/	/	/	/
Initial Coverage							
TROOP SAFETY							
MSD							
Troop Distance from DGZ							
Displacement							
PRECLUSION OF							
Obstacle / Damage							
LSD / LSD							
Distance from DGZ							
Displacement							
MAXIMUM DISPLACEMENT							
AREA / POINT							
$RD/_{RT}$ / $RD/_{CO\ 90}$							
$CD\ 90/_{RT}$ / $d/_{CD\ 90}$							
$d/_{CD\ 90}$ / $d/_{RD}$							
d max							
FINAL DISPLACEMENT							
$RD/_{RT}$ / $RD/_{CD\ 90}$							
$CD\ 90/_{RT}$ / $d/_{CD\ 90}$							
$d/_{CD\ 90}$ / $d/_{RO}$							
FINAL COVERAGE							

REMARKS

TARGET INFORMATION

Description

Category

Radius

Location

Coverage Desired (PRDMPT) (DELAYED)

TROOP SAFETY

Risk: (Neg) (Emer)

Vulnerability: (Unwarned) (Exposed)

(Warned) (Protected)

Distance from DGZ

PRECLUSION REQUIREMENTS

Obstacles:

Damage:

Fallout: (Auth) (Not Auth)

Other:

RECOMMENDATION / FIRE ORDER

UNIT		FIRING POINT
TGT NR	DGZ GRID	TGT ALT
DELIVERY SYSTEM	WARHEAD (MK NR)	YIELD
HOB OPTION	HDB	BACKUP FUZE
DESIRED TOT		LATEST TOT

Predicted Coverage

Best Troop Safety

	Unwrnd Ex	Wrnd Ex	Wrnd Prot
	MSD 3	MSD 2	MSD 1
NEG:			
EMER:			

FORMAT N-6--Continued

SUPPLEMENTAL DATA		
Dazzle Dist at TOT		
LSD: Army $^{a}/_{L}$ in (light		
LSD: Tree Blowdown		
LSD: Fire		
CRATER	Radius	
	Depth	
Fallout Prediction Required		(yes) (no)

POST STRIKE DATA		
Actual TOT		$RD/_{RT}$
Actual GZ CODRD		
Dist GZ – TGT CEN		$d/_{RT}$
Actual Yield		
Actual HOB		$d/_{RD}$
RD min		
Coverage		

REMARKS

Weapon system				
Firing position				
Range				
Agent				
Number of volleys				
CEP (PE)				
HOB (option/meters)				
Height of release				
Fraction of casualties				
TROOP SAFETY				
Minimum safe distance (200 meters + 3.5 PE or 2.5 CEP + Radius of Impact)				
Downwind hazard distance				
Troop distance and direction				
Troop warning necessary	YES NO	YES NO	YES NO	YES NO
LIMITING REQUIREMENT				
Downwind hazard distance				
Distance from aiming point				
Limiting requirement met	YES NO	YES NO	YES NO	YES NO

REMARKS AND COMPUTATIONS

TARGET INFORMATION

Description

Masks (yes) (no) | Prot cat | Exp time

Size | Radius

Location | Tng status

Casualties desired (immediate) (delayed)

Effect desired (contamination) (lethal) (incapacitation) (defoliation)

WEATHER DATA

Temperature | Temperature gradient

Windspeed | Direction

Humidity

TROOP SAFETY

Vulnerability (masked) (unmasked)

Distance | Direction

LIMITING REQUIREMENT

Contamination (yes) (no)

Vapor hazard

Other

Distance | Direction

RECOMMENDATION / FIRE ORDER

Unit	Position	Delivery means	Agent

Weapon | Volleys | Aiming point

Aiming point(s) coordinates

HOB (option)

TOT | Latest TOT | Rate of fire (max) (sust)

AIR DELIVERY

Number of weapons	Flow rate	Intervalometer setting

Coordinates of starting point | Number of flight lines

Coordinates of terminal point | Lateral spacing

Release angle | Height of release

PREDICTED CASUALTIES

TROOP WARNING REQUIREMENT (yes) (no)

FORMAT N–7. NUCLEAR FIRE MISSION SUMMARY

Tgt No.	Grid	Delivery unit	Weapon yield	Nature of tgt	Actual TOT	Results	Remarks

FORM N-8. NUCLEAR ACTION FORM RECORD

HQ_____

Period_____

Originating HQ												
Mission Info	NAF	Remarks	NAF	Remarks	NAF	Remarks	NAF	Remarks	NAF	Remarks	NAF	Remarks

FORMAT N-9. NBC REPORT FORMAT

NATO UNCLASSIFIED

NBC 1

Purpose: Observer's initial report, giving basic data.

Letter	Meaning	Example (Nuclear)	Example (Chemical)	Example (Biological)
	Precedence (See note (1)):			
	Date-time:			
	Security Classification:			
	From:			
	To:			
	Type of report:	NBC 1 (Nuclear)	NBC 1 (Chemical)	NBC 1 (Biological)
A.	Strike serial number (if known).			
B.	Position of observer (UTM or place).	B.LB 196400	MARVILLE	
C.	Direction measured clockwise from grid or magnetic north (state which) of the attack from observer (in degrees or mils) (state which).	C. Grid (degrees)	C. Magnetic	
D.	Date-time attack started.	D. 201405 Z	D. 201405 Z	D. 201405 Z
E.	Illumination time (sec) or time attack ended.	E. 4	E. 201405 Z	
F.	Location of attack (UTM or place) (actual or estimated) (state which).			F. LB 2030, actual
G.	Means of delivery, if known.	----------	G. Aerial	
H.	Type of burst (air, surface, or unknown); or type of toxic agent, if known; or type of attack (BW, CW, registration, harassing, etc.).	H. Surface	H. Nerve	H. Biological
I.	Number of shells, etc.			
J.	Flash-to-bang time (sec).			
K.	Crater present or absent and diameter, if known (in meters).			
L.	Nuclear burst cloud width immediately after passage of shock wave and/or sound of detonation (in degrees or mils) (state which).			
M.	Cloud height (top or bottom) or cloud width (state which) 10 min after burst (in degrees, mils, meters, or feet) (state which)	M. 40,000 feet, top		
S.	----------	----------	S. 201500 Z	S. 201500 Z

Notes.

1. As appropriate or as per unit SOP.
2. NBC 1 follows the same format as the SHELLREP, MORTREP, and BOMREP included in STANAG 2008 dealing with conventional enemy attacks.
3. The type of report and items D and H and either items B and C or item F must always be reported; other items are optional.
4. Users of NBC 1 are not confined solely to the use of the letter items shown in the example; other letter items may be added at the user's discretion.

NBC 2

Purpose: Used for passing evaluation data.

Letter	Meaning	Example (Nuclear)	Example (Chemical and Biological)
	Precedence:		
	Date-time:		
	Security classification:		
	From:		
	To:		
	Type of Report ----------	NBC 2 (Nuclear)	NBC 2 (Chemical/Biological)
A.	Strike serial number ----------	A. 24	A. 1
D.	Date-time attack started ----------	D. 201405 Z	D. 200945
F.	Location of attack (UTM or place) (actual or estimated) (state which).	F. LB. 187486 actual	F. LB 126456, actual
G.	Means of deliver, if known.		
H.	Type of burst (air, surface, or unknown) (state which) (or type of toxic agent.	H. Surface	H. Nerve
N.	Estimated yield (ET) ----------	N. 50	

Notes.

1. This report is normally based on two or more NBC 1 reports. It includes an estimated GZ and, in the case of nuclear detonations, an evaluated yield.
2. When adjacent agencies (e.g., Navy and National NBC Defense) use a different fallout prediction system, this form may be sent to the agencies to provide basic data for their fallout computations.
3. Items A, D, F, H, and N may be repeated as often as necessary to produce a summary report.
4. Users of NBC 2 are not confined solely to the use of the letter items shown in the example; other letter items may be added at the users' discretion.

FORMAT N-10. TACTICAL DAMAGE ASSESSMENT REPORT

Date-time group: _____
From: _____
To: _____

This format is unclassified and remains unclassified unless it contains information of casualties or damage to friendly forces. Information of casualties or damage to friendly forces will be classified SECRET. The report will be completed to the maximum extent possible and transmitted without delay. Additional information will be reported as it becomes available. Classified information will be transmitted separately by secure means.

1. Target number: _____.
2. Target data: _____.
   a. Ground zero _____.
   b. Height of burst (underground, surface, or low or high air) _____.
   c. Weather conditions (at time of strike) _____.
   d. Time of detonation _____.
3. Results (by count or estimation):
   a. Casualties:

	Enemy	Civilian	Friendly
Killed			
Wounded			

   b. Damage effect (radius in meters):

	Severe	Moderate
Buildings		
Tree blowdown		
Tanks		
Wheeled vehicles		

4. Contamination: Reports as indicated in SOP.
5. Obstacles created: _____.
6. General discussion: Include any additional pertinent information.

_____
Name and Rank

_____
Unit

FORM N-11. ALLOCATION SUMMARY (SPECIAL AMMUNITION)

HQ _____

PERIOD _____ POSTED _____ ALLOCATION or ASSIGNMENT (SPECIAL AMMUNITION)

LN NO	COLUMN NO 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A	SYSTEM	X													
B	YIELD	X													
C	X	TOTAL													
D															
E															
F															
G															
H															
I															
J															
K															
L															
M															
N	TOTAL ALLOCATION/OR ASSIGNMENT														
O	TOTAL UNEXPENDED														
P															

NOTES: 1/2

1. Weapons assigned. (Weapons authorized for expenditure).
2. Weapons allocated. (Weapons for planning).
3. This chart is to be used for allocation or assignment.

FORM N-12. DISTRIBUTION SUMMARY (SPECIAL AMMUNITION)

HQ_____ POSTED_____SAL DISTRIBUTION SUMMARY

LN NO	COLUMN NO 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A	SYSTEM														
B	YIELD														
C		TOTAL													
D															
E															
F															
G															
H															
I															
J															
K															
L															
M															
N															
O															
P															
Q															
R															
S.															
T															
U															

Notes:

FORMAT N–13. DAILY AIR RECONNAISSANCE PLAN WORKSHEET

Maps:

AF msn no call sign (1)	TOT (2)	Army request no (3)	Target description (4)	Target grid (5)	Info desired (6)	Remarks (7)

FORMAT N-14. TRANSPORT HELICOPTER REQUEST FORM

Helicopter mission request Number ( )

*A. _____, this is _____. I have a helicopter mission involving (C) troop lift, (D) cargo lift, (E) evacuation, (F) administrative transport, (G) utility, (H) search/rescue.

*B. (1) Date _____ (2) Time _____ (3) Time on station _____ (4) Charts _____
(5) Grid _____

C. TROOP LIFT: (1) Number of troops _____ (2) Pickup grid _____ (3) Landing zone coordinates _____
_____ (4) Number of serials _____ (5) Remarks _____

D. CARGO LIFT: Internal, external, pallet, weapon, net.
(1) Total weight _____ (2) Number of serials _____
_____ (3) Remarks _____

E. EVALUATION: (1) Number of casualties _____ (2) Number of serials _____ (3) Remarks _____

F. ADMINISTRATIVE TRANSPORT: Courier, VIP. (1) Number of persons _____ (2) Baggage weight _____
(3) Pickup grid _____ (4) Landing zone grid _____
_____ (5) Number of serials _____
(6) Highest rank _____ (7) Return time _____
_____ (8) Remarks _____

G. UTILITY: Wire laying, spraying, liaision, UDT, photo, reconnaissance.
(1) Other mission _____
(2) Remarks, time, location _____

H. SEARCH/RESCUE: Downed aircraft, other mission _____
_____ (1) Number of personnel _____
(2) Description _____ (3) Grid to be searched _____
_____ (4) Remarks _____

---

*I. LANDING ZONE DESCRIPTION: Prepared, unprepared, zone, site, clearing field, ship (site no) _____ (1) Number of sites _____
(2) Alternate _____ (3) Remarks _____

*J. LANDING ZONE MARKINGS: Colored panels, smoke, lights, flare, flags (1) Color _____ (2) Remarks _____

*K. COMMUNICATIONS: UHF, HF, LF, VHF (1) Primary _____
_____ (2) Alternate _____ (3) Reporting point _____
_____ (4) Report to _____ (5) Remarks _____

See footnote at end of format.

MISSION APPROVAL AND BRIEFING MESSAGE

*L. _____, this is _____. Mission no _____approved, canceled; with no _____ type aircraft. Restrictive fire plan (SOP code) _____ in effect from _____ until _____

(1) Routes to be flown

(2) Escort and support aircraft assigned: VH _____ VA _____

(3) Call sign of escort and support aircraft _____ Frequencies _____ Time on station _____

(4) Remarks _____

Note: All items marked with an asterisk (*) must be filled out on every mission. THIS FORMAT CONSTITUTES WRITTEN ORDERS TO THE PILOT. NO DEVIATION WILL BE MADE EXCEPT TO MEET EMERGENCY SITUATIONS. ANY DEVIATION WILL BE REPORTED.

FORMAT N-15. AIRLIFT REQUEST FORMAT

Date _____

A. Unit requesting airlift: _____

B. Pickup point: _____

C. Delivery point: _____ Airland _____

Airdrop _____ D. Date and time first available for pickup: _____

E. Latest acceptable in-place date at destination: _____

_____ F. Number of personnel: _____

_____ Weight of baggage (fld gear, etc.): _____

G. Additional equipment less vehicles (weight and cube): _____

H. Number of vehicles by type (dimensions/weight and cube): _____

I. Largest single item (dimensions and weight): _____

J. Any restrictive cargo: _____

K. Contact and alternate at pickup point: _____

L. Contact and alternate at delivery point: _____

M. Total weight and cube (do not include passenger weight) : _____

N. Remarks, special instructions, justification (special equipment required, litters, number of airdrop items with weight and cube of each, etc.) _____

APPENDIX O

TARGET CLASSIFICATION AND METHODS OF ATTACK

Target	*Ammunition	Designation		Method
		Location	Size	
Pinpoint	HE quick HE delay HE VT HE time Smoke BE (HC or colored) Smoke WP Special	Grid to nearest 10 meters	Not given	(1) Planes of fire parallel (2) Converged
Registration	HE quick HE time	Grid to nearest 10 meters	Not given	Registration procedures
Destruction	HE quick HE delay HE concrete piercing	Grid to nearest 10 meters	Not given	Destruction procedures

Target	*Ammunition	Designation		Method
		Location	Size	
Mark	HE quick Smoke	Grid to nearest 10 meters	Not given	Round(s) fired for identification
Area	HE quick HE delay HE VT HE time Smoke BE (HC or colored) Smoke, WP Special	Grid to nearest 10 meters	1. Radius of target 2. Length, width, and attitude	(1) Planes of fire parallel (2) Converged (3) Open (4) Range/lateral spread (5) Fire units directed at different parts of target
Area	Illuminating	Grid to nearest 10 meters	1. Radius of target 2. Length, width, and attitude	Illumination procedures

Target	*Ammunition	Designation		Method
		Location	Size	
Linear	HE quick HE delay HE VT HE time Smoke HC Smoke WP Special	Grid to nearest 10 meters	Length and attitude	Individual cannons (missiles) directed at specified points along the length
Moving barrage (CDA/AUST) Searching and/ or zone fire (US)	HE quick HE VT HE delay HE time	ABCA format Grid to nearest 10 meters	Length, width, and attitude	Individual guns directed at specified points along the width; fire moves forward as directed
Radar adjustment	Pinpoint or area targets	Grid to nearest 10 meters	Pinpoint or area targets	Radar adjustment procedures

Target	*Ammunition	Designation		Method
		Location	Size	
Sound adjustment	Pinpoint or area targets	Grid to nearest 10 meters	Pinpoint or area targets	Sound adjustment procedures

*The types of ammunition listed in this column do not preclude the use of other types of ammunition.

APPENDIX P
ILLUSTRATIVE FIRE SUPPORT ANNEX

(Numbers in parentheses refer to explanatory notes.)

	Explanatory Notes
(1) Classification	(1) *The security classification* assigned to the fire support annex appears at the top and at the bottom of each page of the annex, to include overlays, appendixes, tabs, and inclosures.
(2) Copy No. 14	(2) *Heading and copy number.* If the annex is distributed with and to the same addressees as the Operations Order, the heading may be omitted. If the annex is distributed more widely or at a different time than the operations order, the heading is shown here along with the copy number. The copy number helps to account for the annex should it be classified.
(3) 1st Inf Div	(3) *The force headquarters* responsible for the conduct of the operation. It may be in code.
(4) PACIFIC CITY (1935), BAHA	(4) *Place of issue* is expressed as a general geographic location (town or place), amplified by coordinates in parenthesis, and country. It may be shown in code.
(5) 131800 Sep	(5) *Date-time group.* This is the time the annex is signed and the time it is effective unless the time effective is otherwise indicated in the body of the annex. Time must include time zone suffix.
(6) GT 36	(6) *Message reference number.* It is expressed as a coded symbol and is assigned from a block of numbers provided by the division signal officer. Its use makes easy the acknowledgement of the annex.
(7) Annex C (Fire Support) to OPORD 18—1st Inf Div	(7) *Designation of the fire support annex.* The fire support annex is issued as an annex to the op order, with the appropriate letter designation specified by the G3 followed by reference to the basic document.
(8) Reference: Map Series M503 BAHA Sheets 4224 IV C CAPE FORTH-AHTENAL 1, 4225 I (LUNCH FORD), Edition 02 1 : 50,000	(8) *References.* Maps or publications necessary to the understanding of the annex by all recipients are listed. Maps should be identified as accurately as possible. It will include map series number (and country or geographical area if required), sheet number (and name if required), edition, and scale. Maps shown in the illustrative Fire Support Annex are fictitious.
(9) Time Zone	(9) *Time zone used throughout the order.* If recipients are located in two or more time zones, the time zone applicable to the operation is shown. Times in other zones are converted to this time zone for this operation.

(10) 1. SITUATION _____

(10) *Situation.* State in subparagraphs *a, b,* and *c,* respectively, so much of the general situation as is deemed necessary for commanders and staffs of the fire support agencies to know concerning enemy capabilities which can affect fire support agencies. Show the fire support units which will support the force or reinforce the fires of organic or attached units and those which are attached to, or detached from, the force.

(11) *a.* Enemy Forces.

(1) Annex A Intel to OPORD 18.

(2) Enemy air capable of 40 bomber and 150 fighter-bomber sorties per day in zone of 1st Corps

(11) *Enemy forces.* Refer to the current intelligence annex or publication which contains information concerning the enemy situation. If pertinent, refer to any particular enemy capability (such as air) which may have a definite impact on fire support agencies.

(12) *b.* Friendly Forces.

(1) 1st Corps attacks 140430 Sep with 1st Inf Div on the east, 2d Inf Div on the west; seizes the north bank of the IDAWANA River; and destroys enemy in zone.

(2) 9th TAF supports 1st Army with minimum allocation of 300 CAS sorties daily for period 140400 to 152000 Sep. Priority to 1st Corps until seizure of north bank of IDAWANA.

(3) Artillery support.

(*a*) 1–96FA (Pershing) GS 1st Army. Priority of fires to 1st Corps.

(*b*) 4th Armd Div Arty—GSR 1st Inf Div Arty; or order revert to 4th Armd Div control.

(*c*) 101st FA Gp: Reinf 1st Inf Div Arty.

(4) Naval support. Fire support Group (TG 38.1) supports 1st Corps; Fire Support Unit Two (TU 38.12) provides support to 1st Inf Div.

(12) *Friendly forces.* Provide as much information concerning the next higher, adjacent, supporting, and reinforcing units as is required for coordinated action by recipients of the fire support annex. List the units furnishing air support to the army or corps. Follow with supporting fire support units organic or attached, on which the force may call directly for fire support (e.g., corps FA GSR or Reinf bns or groups or naval units is GS or DS). Organization for combat of reinforcing units may be shown. Long-range missile units with a mission or GS that may possbily fire in support of the force operation may also be included. Information shown in this paragraph should be limited to that which subordinate or fire support agencies need to know to accomplish their mission.

(13) Attachments and Detachments.
(Atchd eff 131900 Sep).

(1) 1–40FA(105mm, SP)

(2) 6–50FA (155mm, SP)

(3) 1–48FA (SP)

(13) *Attachments and detachments.* List fire support units which are now attached, or which are attached or detached by the operation order, together with the effective date and time.

(14) 2. MISSION

Fire support agencies support division operations with conventional and special ammunition, as required.

(14) *Mission.* The mission is a clear, concise statement of the fire support tasks to be accomplished by fire support agencies. Essential elements of the force mission may be included when it is necessary to clarify fire support requirements. It normally includes WHO, WHAT, WHEN, and as appropriate, WHY, and WHERE. There are no subparagraphs.

(15) 3. EXECUTION

(15) *Execution.* In separate lettered subparagraphs, give a brief concept of the operation and indicate fire support to be rendered by available

(16) *a.* Concept of Operation.

(1) Maneuver. The attack will be a rapid exploitation of nuclear fires. Surprise is vital. Maximum dispersion consistent with accomplishment of the mission will be maintained throughout the operation. Division will penetrate agressor positions with two brigades abreast. 1st Bde on the west makes main attack and seizes Objective 1.

(*a*) 2 Bde on the east seized Objective 2.

(*b*) 3d Bde in reserve.

(2) Fires. At H–30, division will employ one CHARLIE weapon on enemy forces on Hill 374 (1939) and one ALFA weapon on Hill 412 (2241). A 35-minute non-nuclear preparation will be fired beginning at H–25. Initial division reserve consists of two CHARLIE weapons.

(17) *b.* ADA (omitted) _____

(18) *c.* Air Support

(1) General. Sixteen fighter-bombers on air alert from H-hour to H + 1 hour over corps zone to be assigned missions as approved by CTOC. Armament—mixed load.

(2) Allocations. Priority of air support to 1st Inf Div for period 140400 to 140900 Sep.

(3) Miscellaneous. Appendix 1 (Air Fire Support)

(19) *d.* Field artillery support.

(1) General. Field artillery will support the attack with a nuclear preparation commencing at H–30. H-hour is

fire support agencies, such as air, field artillery, and naval gunfire. When available, nuclear and chemical weapons, although not separate fire support agencies, are also listed separately to indicate the importance attached to their support. List fire support agencies in alphabetical order.

(16) The first subparagraph in paragraph 3 of the fire support annex is the concept of the operation. The concept of operation states the scheme of maneuver and plan of fire support. The commander's concept may be copied verbatim from the operation order. Normally, however, the portion relative to maneuver (if extensive) is condensed and the portion relative to the fire support agencies is given in detail. The maneuver subparagraph may provide the commander's visualization of the conduct of the overall operation, it may clarify the purpose of the operation, and discuss phasing (if the operation has been phased). The fires subparagraph includes priority of fires when appropriate and, if a preparation is to be fired, its time and duration, as well as the employment of nuclear and chemical fires. Tasks for available fire support agencies are shown in succeeding paragraphs in alphabetical order.

(17) Should Air Defense Artillery be used as fire support against surface targets a separate subparagraph is provided showing the three subdivisions—General, Organization for Combat, and Miscellaneous. Further, a ADA appendix to the fire support annex to the operations order may be prepared.

(18) *Air support.* This paragraph is divided into three subparagraphs —General, Allocation, and Miscellaneous. General gives information concerning air support available to higher headquarters and the commander's desire on use of such air support, other than that specifically allocated. Allocations (first subparagraph); give allocation to higher headquarters and no further allocations to subordinate units (second subparagraph). Give allocations to subordinate units. (Allocations are not normally suballocated below corps level except for planning purposes.) Miscellaneous. Give miscellaneous coordinating instructions and information concerning air support or the method and time of requesting preplanned airstrikes when such are not covered by SOP. As a minimum this subparagraph must make reference to the air fire support appendix.

(19) *Field artillery support.* This paragraph is divided into three subparagraphs—General, Organization for Combat, and Miscellaneous. *FA General.* Give information of the echelons of field artillery, such as corps

140430. A nonnuclear preparation will be fired from H–25 to H + 10.

(2) Organization for combat.

(*a*) Div arty
1–3FA DS 1st Bde
1–5FA DS 2d Bde
1–7FA GSR 1–3FA
o/o DS 3d Bde
1–9FA GSR 1–5FA
1–10FA (HJ) GS
1–40FA Reinf
6–50FA GS

(*b*) Reinf arty.
101 FA Gp:
1–50FA (155mm, SP)
1–51FA (155mm Towed)
1–70FA (8–in SP)
2–10FA (8–in SP)

(3) Miscellaneous.

(a) 1–3FA plans fires of 1–7FA for the preparation only.

(*b*) 1–5FA will plan fires of 1–9FA from H–10 to H + 10.

(*c*) Appendix 2 Field artillery fire support.

(20) *e.* Naval gunfire support

(1) General. Fire supports Unit Two (TU 38.12) support the attack beginning H–1 hour; support the attack with preparation from H–25 to H + 10.

(2) Allocation of naval gunfire support.

(*a*) ICA: GS div until rel on corps order.

(*b*) IDD: DS 1st Bde.

(3) Miscellaneous. Appendix 3, Naval Gunfire Support.

(21) *f.* Nuclear Support. Appendix 4, Nuclear Fire support.

(1) Subordinate units will be notified of nuclear fires through command fire direction channels.

(2) Tactical damage assessment reports to div FSE.

(3) Fire spt app to div FSE prior to 132200 Sep.

of division artillery, which will support the operation; information concerning the preparation, if any, and its duration; and any restrictions placed on the use of higher echelon artillery with a primary mission of reinforcing artillery. *FA Organization for combat.* Division artillery. Give information for organization for combat of field artillery units organic or attached to the command. A mission must be assigned to each. List FA Groups attached to the division and show elements thereof. List division artillery units, organic or attached, in the order as specified by the FSCOORD. Batteries assigned a separate tactical mission under division artillery control are listed separately in alphabetical sequence immediately following the parent battalion. Reinforcing field artillery. Give instructions to any artillery units, organic or attached, which have a mission of reinforcing division artillery. Organization for combat of reinforcing units will be shown here if not shown in paragraph 1*b*. *Miscellaneous.* Give miscellaneous instructions and information that affect more than one unit, such as instructions may also include nonnuclear special ammunition. As a minimum, this subparagraph will contain a reference to the field artillery fire support appendix.

(20) *Naval Gunfire support (when applicable).* This subparagraph is similar to the air support paragraph and gives general information, allocation of support from higher headquarters, plus suballocations of fire support and of control personnel to lower echelons. These are followed by miscellaneous instructions. As a minimum, the miscellaneous subparagraph will contain a reference to the naval gunfire support appendix.

(21) *Nuclear support (when applicable).* This subparagraph will contain, as a minimum, a reference to the nuclear fire support appendix. It may be similar to the air support subparagraph and give the general plan of employment and, if appropriate, allocations and assignment of weapons. The last item, miscellaneous, would contain a reference to the nuclear fire support appendix.

(22)

(23) 4. SERVICE SUPPORT

a. General. Annex E, Service

b. Support overlay to OPORD 18.

Materiel and Service:

CL V: ASR 132400-182400

(1) 105mm how (HE) 150

(2) 155mm how (HE) 150

(3) 8-in how (HE) 60

(4) Other types—no restrictions.

(24) 5. COMMAND AND SIGNAL

a. Signal.

(1) SOI, Index 1–66 eff 14001 Sep

(2) Normal radio traffic prior to attack.

(3) Annex S Communication/Electronics to OPORD 18.

b. Command.

(1) FSE located at div CP.

(2) Div arty CP (initial), LE 190360.

(25) Acknowledge.

Note. When a small number of nuclear fires are planned, they may be included in the fire support appendix for system (FA, air, etc) and no nuclear fire support appendix is documented. Normally all fires will be included in a single nuclear fire support appendix when there are many targets to be attacked with nuclear fires.

(22) *Coordinating Instructions.* This is the last subparagraph of paragraph 3. Its actual letter designation depends on the number of fire support agencies available. This subparagraph contains instructions applicable to two or more fire support agencies, such as procedures for the marking of airstrikes by ground fires, restrictions on firing by ground and naval weapons while friendly aircraft are conducting airstrikes, procedures for coordinating flak suppression fires, and the time that fire support annexes and appendixes must be submitted to the agency responsible for fire support coordination. Miscellaneous troop safety instructions, such as permissible exposure to radiation, protection during nuclear blasts, and notification to subordinate units of impending use of nuclear weapons by friendly forces, are also included when applicable. Further items of interest to units, such as the location of the FSCL and counterbattery tactics, such also be included.

(23) *Service support.* Refer to the current Admin/Log Order or service support annex. List any special administrative instructions applicable to this operation and of concern to the fire support agencies, such as a directive to dump ammunition in excess of basic load on position. State only items which are of interest to fire support agencies and which require special emphasis or have changed since the Admin/Log order was published. These may include the location of the division ammunition office (DAO) and appropriate available supply rates. The SAL may also be included.

(24) *Command and signal.* Refer to the current communications/electronics annex and index to the communication-electronic operation instructions (CEOI), if appropriate. Under command, state locations of the agency(ies) responsible fire support coordination. Their locations may be shown, if desired, even when located as given in the SOP.

(25) Acknowledgement instructions. If the issuing headquarters wishes acknowledgement of receipt of the annex by addressees, the word "acknowledge" must appear after paragraph 5. Acknowledgement connotes receipt, understanding, and intent to comply. The message reference

(26) GLEASON
MG

OFFICIAL:

/s/ Trask
TRASK
G3

(27) Appendixes: 1—Air Fire Support.
2—FA Fire Support.
3—Naval Gunfire Spt.
4—Nuclear Fire Spt.
5—ADA Support.

(28) Distribution: A
4th Armd Div Arty
101st FA Gp
Naval Fire Support Unit Two (TU 38.12)
9th TAF

number is the code designation used when recipients are acknowledging receipt either by electronic or written communication.

(26) The original of the first support annex, like the original of the operation order, is signed by the force commander or his authorized representative. The annex is authenticated by the force GS(S3), who has the staff responsibility for the integration of fire support with the scheme of maneuver.

(27) If the fire support annex becomes so lengthy that recipients will have difficulty locating the instructions pertaining to them, appendixes may be used to keep the basic annex as short as possible. Appendixes will be referred to in the appropriate portion of the annex and listed under the heading of appendixes in the ending as shown.

(28) *Distribution.* If distribution is to be made according to a standard distribution list, it may be indicated as Distribution A, C, etc. Recipients not included in the standard list must be shown separately. A standard distribution list may not be appropriate for the order being issued, and a separate appendix showing recipients, number of copies, and copy numbers may have to be prepared.

APPENDIX Q

STANDARDIZATION AGREEMENT (STANAG) NO. 2104

Standardization Agreements (STANAG) are international (NATO) agreements designed to facilitate interallied operations. Upon ratification by the United States, a STANAG is binding upon US Army Forces (entirely or with exceptions as noted). Following is STANAG No. 2104, as amended in its entirety.

NATO—UNCLASSIFIED
DETAILS OF AGREEMENT (DofA)
FRIENDLY NUCLEAR STRIKE WARNING TO ARMED FORCES OPERATING ON LAND

Q-1. AGREEMENT

It is agreed that the NATO Armed Forces will adopt the following system of friendly nuclear strike warnings for use at corps level and below. This applies to surface-to-surface and air-to-surface strikes in support of ground forces, and to emplaced atomic demolition munitions (ADMs).

Q-2. GENERAL

The requirement for a standard warning message and delineation of notification channels is essential to ensure that timely warning of friendly nuclear strikes is provided so that Armed Forces personnel may take individual measures to protect themselves.

Q-3. WARNING RESPONSIBILITIES

a. Responsibility for issuing the warning rests with the executing Commander.

b. Commanders authorized to release nuclear strikes will ensure that strikes affecting the safety of adjacent or other commands are coordinated with those commands in sufficient time to permit dissemination of warnings to Armed Forces personnel and the taking of protective measures. Conflicts must be submitted to the next higher Commander for decision.

Q-4. DETERMINATION OF HEADQUARTERS, FORMATIONS/ UNITS TO BE WARNED

a. The Commander responsible for issuing the warning should inform:

(1) Subordinate Headquarters whose units are likely to be affected by the strike.

(2) Adjacent Headquarters whose units are likely to be affected by the strike.

(3) Own next higher Headquarters, when units not under the command of the releasing Commander are likely to be affected by the strike.

b. Each Headquarters receiving a warning of nuclear attack will warn subordinate elements of the safety measures they should take, in the light of their proximity to the Desired Ground Zero (DGZ).

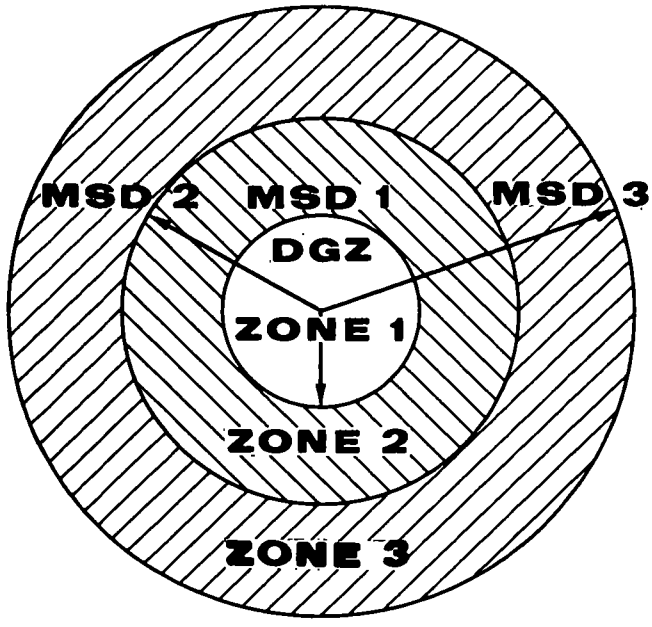
c. Each unit concerned, down to the lowest level, will be warned by its next higher level of the safety measures it should take.

(1) Negligible risks should normally not be exceeded unless significant advantages will be gained.

(2) Maximum protection denotes that Armed Forces personnel are in "buttoned-up" tanks or crouched in foxholes with improvised overhead shielding.

(3) Minimum protection denotes that Armed Forces personnel are prone on open ground with all skin areas covered with an overall thermal protection at least equal to that provided by a two-layer uniform.

Q-5. ZONES OF WARNING AND PROTECTION REQUIREMENTS FOR FRIENDLY NUCLEAR STRIKES



Notes:

1. MSD means Minimum Safe Distance.
2. The MSD is equal to a radius of safety (Rs) for the yield, plus a buffer distance (d_b) related to the dispersion normal to the weapon system used. When surface bursts are used, the fallout hazard will be considered and appropriate buffer distances included.

Radius	Corresponding to	Zone	Requirements
DGZ		1	Evacuation of all Armed Forces personnel (see note).
MDS 1	Limit of negligible risk to warned and protected Armed Forces personnel (see note).		
		2	Maximum protection. (see note).
MSD 2	Limit of negligible risk* to warned and exposed Armed Forces personnel.		
		3	Minimum protection. (see note).
MSD 3	Limit of negligible risk* to unwarned and exposed Armed Forces personnel		
More than MSD 3			No protective measures except against dazzle.

* As defined in STANAG 2083.

Note. Commanders will be guided by safety criteria as stated in FM 101-30-1, Staff Officers Field Manual, Nuclear Weapons Employment (or appropriate national manuals with the same criteria).

Q-6. WARNING MESSAGES

Warning messages will include the following information (see STANAG 2103):

STRIKWARN

ALPHA: Code word indicating nuclear strike (target number).

DELTA: Date-time group for time of burst in ZULU time. The time after which the strike will be cancelled (ZULU time).

FOXTROT: DGZ (UTM grid co-ordinates).

HOTEL: Indicate air or surface bursts.

INDIA: For all bursts:
MSD 1 in hundreds of meters, four (4) digits
MSD 2 in hundreds of meters, four (4) digits
MSD 3 in hundreds of meters, four (4) digits

YANKEE: For all bursts when there is less than a 99 percent assurance of no militarily significant fallout. Direction measured clockwise from grid north to the left and then to the right radial lines (degrees or mils—state which) four (4) digits each.

ZULU: For all bursts when there is less than a 99 percent assurance of no militarily significant fallout. Effective wind speed in kilometers per hour, three (3) digits. Downwind distance of Zone 1 (km), three (3) digits. Cloud radius (km), two (2) digits.

Q-7. EXAMPLE MESSAGES

FOR ALL BURSTS WITH 99 PERCENT ASSURANCE OF NO MILITARILY SIGNIFICANT FALLOUT STRIKWARN. ALPHA TUBE SIX. DELTA PQ WM OT AR/AS DG WY OF. FOXTROT YM AB IM SK. HOEL AIR. INDIA 0022 0031 0045. FOR ALL BURSTS WITH LESS THAN 99 PERCENT ASSURANCE OF NO MILITARILY SIGNIFICANT FALLOUT STRIKWARN. ALPHA TUBE SIX. DELTA PQ WM OT AR/AS DG WY OF. FOXTROT YM AB IM SK. HOTEL SURFACE. INDIA 0022 0031 0045. YANKEE 0215 0255 DEGREES. ZULU 025 080 18.

Q–8. IMPENDING STRIKE WARNING

Warning of impending strikes will be initiated no earlier than is necessary to complete warning of Armed Forces personnel. Any available means of communications—land lines if possible—will be utilized to ensure that all Armed Forces personnel requiring warning are notified.

Q–9. ACTION ON CANCELLED STRIKES

When nuclear strikes are cancelled, units previously warned will be notified in the clear by the most expeditious means in the following format:

a. Code Word (Target Number)

b. CANCELLED

Q–10. USE OF CODES

a. Items DELTA and FOXTROT above will not be sent in clear unless the time of initiating the warning message is such that no loss of security is involved.

b. Only coding systems which meet NATO security criteria will be used.

Q–11. OTHER WARNINGS

a. It is recognized that it is impractical to obtain warnings of surface-to-air (for instance, air defense) nuclear burst which may occur at low altitudes, and to disseminate such warnings to Armed Forces personnel.

b. Similarly, it may be impractical to provide warning to the Naval and Air Forces concerned of intended surface-to-surface strikes delivered by weapons within the corps, especially for fleeting targets or when reaction times are short. Nevertheless, it is the responsibility of Army agencies to provide warning to Naval and Air Forces concerned whenever possible.

Q–12. IMPLEMENTATION OF THE AGREEMENT

a. This STANAG will be considered to have been implemented when the necessary orders/instructions putting the procedures detailed in this agreement into effect have been issued to the forces concerned.

b. Related Documents.

(1) STANAG 2083—Radiological Hazards.

(2) STANAG 2099—Fire Coordination in the Land/Air Battle.

(3) STANAG 2103—Reporting Nuclear Detonations, Radioactive Fallout and Biological and Chemical Attacks.

APPENDIX R

STANDARDIZATION AGREEMENT (STANAG) NO. 2099 (EDITION NO. 2)

Standardization Agreements (STANAG) are international (NATO) agreements designed to facilitate interallied operations. Upon ratification by the United States, a STANAG is binding upon US Army Forces (entirely or with exceptions as noted). STANAG NO. 2099—FIRE COORDINATION IN SUPPORT OF LAND FORCES. Following is STANAG No. 2099 in its entirety.

NATO—UNCLASSIFIED
DETAILS OF AGREEMENT (DofA)
FIRE COORDINATION IN SUPPORT OF LAND FORCES

R–1. AGREEMENT

It is agreed that the NATO Armed Forces will follow the principles laid down herein in prescribing procedures for fire coordination in support of the land forces. These principles apply to the use of conventional and nuclear weapons in the tactical role. They do not apply to weapons with an air defense mission which are subject to special control and safety procedures.

R–2. DEFINITION AND OBJECT OF THE FIRE SUPPORT COORDINATION LINE

The Fire Support Coordination Line (FSCL) is a line which takes the place of a bombline. It is used in relation to air, ground or sea delivered conventional or nuclear weapons. It should be established by the appropriate land (normally the corps) Commander in consultation with the Tactical Air Commander or his Delegate. It is used to coordinate supporting fire by forces not under the control of the appropriate land force commander which may affect current tactical operations.

R–3. CHARACTERISTICS

a. The FSCL should be as close to the forward elements as possible consistent with troops safety and the tactical situation. Furthermore, it should be easy to define on a map and easily recognized from the air.

b. When detached forces are beyond this FSCL, another all-round FSCL should be established around the detached forces.

R–4. CONDITIONS FOR SPECIAL COORDINATION

a. Coordination must be effected with the land force commander concerned prior to the use of fire support against targets within the force boundaries short of the FSCL; it must also be effected prior to the use of weapons whose effects (except dazzle and radiological fall-out from an accidental surface burst) may cross the FSCL toward friendly forces. Where the weapon effects will cross the boundary separating two land force commands so as to affect friendly forces on either side, coordination must be effected with or between both land commands concerned.

b. A FSCL is not normally required for units lower than the corps. The current "No Fire Line" and boundaries will normally provide adequate control measures at these levels.

c. Coordination of fires should be effected through normal fire support coordination channels adhering to the principle that the supporting force need not coordinate with more than one headquarters. In the case of air strikes short of the FSCL, the air forces should coordinate with Corps Headquarters of the land force command through the appropriate Army Headquarters.

d. A request by a unit for air support or additional artillery support on a target short of the FSCL but which has been coordinated with and passed by the land command concerned, obviates the necessity for further check by the delivery unit.

R–5. FIRE SUPPORT COORDINATION LINE (FSCL) MESSAGE

The Fire Support Coordination Line (FSCL) Message is used to inform bases, aircraft carriers and interested units/formations of the current FSCL. An example is attached at Annex A (DOfA).

R–6. RELATED DEFINITIONS

a. A related definition is that of "No Fire Line," which has already been agreed and is included in AAP–6. It is as follows:

> "A line short of which artillery or ships do not fire except on request of the supported commander, but beyond which they may fire at any time without danger to friendly troops."

b. The use of a "No Fire Line" is a matter of national policy.

R–7. IMPLEMENTATION OF THE AGREEMENT

This STANAG will be considered to have been implemented when the necessary orders/instructions putting the procedures detailed in this Agreement into effect have been issued to the forces concerned.

ANNEX A (DofA) TO STANAG 2099
(Edition No. 2)

R–8. FIRE SUPPORT COORDINATION LINE (FSCL) MESSAGE

a. Purpose. The standard form of message whereby air bases, aircraft carriers and interested units/formations, are informed of the current FSCL (See note a.).

b. Format.

USE STANDARD MESSAGE FORM HEADING
(See Notes)

FORMAT (Not to be transmitted)	EXAMPLE MESSAGE
FSCL: Always start of message	FSCL
(1) FSCL SERIAL NUMBER.	A. 12.
(2) DATE AND TIME OF EFFECTIVENESS	B. 071200Z.
(3) DESCRIPTION OR CODE NAME (See note 4.).	C. WHITE LADY
ACKNOWLEDGE (See note 5.).	ACK

e. Notes

(1) Procedure. The message is passed to airfields and aircraft carriers by means of Tactical Air Command Nets wherever possible, and to units/formations by Command Channels, or, in emergency, by Tactical Air Request Net.

(2) Precedence. Depending on the tactical urgency to the addressees in relation to other message traffic.

(3) Security. Classified in accordance with local SOPs.

(4) Description or Code Name. The FSCL may be given by map coordinates or by a previously arranged code name.

(5) Acknowledgement Instructions. It is essential that the originator knows that all addressees have received and understood the message.

APPENDIX S

STANDARDIZATION AGREEMENT (STANAG) NO. 2082

Standardization Agreements (STANAG) are international (NATO) agreements designed to facilitate interallied operations. Upon ratification by the United States, a STANAG is binding upon US Army Forces (entirely or with exceptions as noted). STANAG NO. 2082 (EDITION NO. 2)—RELIEF OF COMBAT TROOPS. Following is STANAG No. 2082 in its entirety.

NATO—UNCLASSIFIED
DETAILS OF AGREEMENT (DofA)
RELIEF OF COMBAT TROOPS

S–1. AGREEMENT

It is agreed that the NATO Army Forces are to adopt the principles prescribed in this Agreement for a relief in place, a passage of lines and a withdrawal through a rearward position.

S–2. DEFINITIONS (These definitions are taken from AAP–6—"The NATO Glossary of Military Terms and Definitions in English and French," where applicable.)

a. Relief in Place. A combat operation in which, by direction of higher authority, all or part of a unit is replaced in a combat area by the incoming unit. The responsibilities of the replaced elements for the combat mission and the assigned zone of operations are transferred to the incoming unit. The incoming unit continues the operation as ordered.

b. Passage of Command. The outgoing unit commander is responsible for the defense of his assigned sector until command passes. The moment when command is to pass is determined by mutual agreement between the two unit commanders unless directed by higher headquarters. It normally occurs when the front line subunit commanders have assumed responsibility of their sectors and the incoming unit commander has sufficient communications facilities in operation to exercise control over his entire sector. (Applicable to Relief in Place only.)

c. Passage of Lines. An operation in which an incoming unit attacks through a unit which is in contact with the enemy. Subunits of the unit being passed through remain in position until their fires have been masked, at which time they may undertake another mission.

d. Withdrawal Through a Rearward Position. An operation in which a unit effecting a retrograde movement (withdrawal) passes through the sector of a unit occupying a rearward defensive position.

e. Unit. For the purposes of this Agreement, the term "Unit" means unit and/or formation.

S–3. PRINCIPLES

a. Relief in Place.

(1) Relief operations must be executed in an expeditious and orderly manner.

(2) Units in forward combat areas are normally relieved at night or during periods of reduced visibility.

(3) Very close cooperation and coordination of plans is necessary between the commanders and subordinates of both the incoming and outgoing units.

(4) Detailed prior reconnaissance by the incoming unit is essential.

(5) The incoming unit must fit into and accept the general defense plan of the outgoing unit until passage of command.

(6) During the relief, to preserve secrecy, normal patterns of activity in a defense sector should be maintained.

(7) Every effort must be made to effect the relief without weakening the tactical security of the position and by offering the least profitable target for attack by nuclear weapons.

(8) Units of the supporting arms normally should not be relieved at the same time as the infantry units they support.

b. Passage of Lines.

(1) The unit in contact and the field artillery in position must provide all possible aid to the attacking unit.

(2) The incoming unit must have priority in the use of facilities.

(3) Secrecy and surprise are of paramount importance.

(4) Close cooperation and the coordination of plans between the commanders of the incoming unit and the unit in place and their subordinates and staffs at all levels is very important.

(5) The plan should include specific measures to minimize the vulnerability of both units to enemy nuclear weapons.

c. Withdrawal Through a Rearward Position.

(1) The unit in position provides all possible aid to the withdrawing unit. The unit in position holds up the enemy on its defensive position after the withdrawing unit has passed through.

(2) The withdrawing unit must have priority on roads and facilities, provided it does not prejudice the defense.

(3) Close coordination and cooperation between commanders of the withdrawing force and the force in position are of great importance.

(4) In planning movement back, to and through the defensive position, every effort must be made to avoid presenting worthwhile nuclear targets.

(5) The responsibility of the withdrawing force for the delaying action terminates upon passage through the defensive position, or such later time as may be directed by higher authority.

(6) Coordination and control is facilitated if sector boundaries for both the unit in position and the withdrawing unit are made to coincide and points of passage through the defensive are reduced to a minimum.

(7) Layout of the defensive position, fire plan, security, vulnerability and the delaying mission must be considered in selecting points for passing through. When possible, routes of withdrawal, particularly for armor, should avoid local prepared defensive positions.

(8) The commander of the withdrawing unit is responsible for identifying the last element of his command as it passes through the unit in position.

(9) A detailed plan for mutual recognition must be prepared and carefully coordinated by the withdrawing unit and the unit in position.

S–4. IMPLEMENTATION OF THE AGREEMENT.

This STANAG will be considered to have been implemented when the necessary orders/instructions putting the principles detailed in this Agreement into effect have been issued to the forces concerned.

S–5. RELATED DOCUMENTS.

None.

APPENDIX T

(NOT USED)

APPENDIX U

(A TYPE DIVISION FIRE SUPPORT ELEMENT INTERNAL STANDING OPERATING PROCEDURE)

SECTION I. GENERAL

U–1. REFERENCES

a. _____ Corps Standing Operating Procedures, dated _____.
b. _____ Division Standing Operating Procedures, dated _____.

U–2. PURPOSE

a. This SOP standardizes routine FSC internal procedures and provides guidance for personnel charged with the operation of the fire support element of a division tactical operations center.

b. The information presented herein is based on personnel and equipment authorized by TOE 6–302. Equipment and personnel augmentation may be required.

U–3. DEFINITIONS

a. The following definitions are used throughout this document:

(1) *Division tactical operations center (DTOC)*—A physical groupment of those elements of the division general and special staff concerned with current tactical operations and tactical support operations.

(2) *Fire support element (FSE)*—An element of the tactical operations center at division and higher level in which are centralized communication facilities and personnel incident to the coordination of all forms of fire support.

(3) *Fire support*—Assistance to those elements of the ground forces which close with enemy, such as infantry and armor units, rendered by delivering field artillery fire, naval gunfire, and aircraft strafing and bombardment.

(4) *Fire support coordination*—The coordinated planning and initiating of fire support so that targets are adequately attacked by appropriate means of weapons available.

(5) *Fire support coordinator (FSCOORD)*—A special staff officer, usually the force artillery officer, who is charged with the specific responsibility for coordinating all fires on surface targets.

b. Additional definitions are contained in the glossary, appendix B.

SECTION II. ORGANIZATION

U–4. PRIMARY AND ALTERNATE FSE

a. The FSE will maintain a primary location and an alternate location at all times. The duty team will operate the primary FSE within the DTOC at the division CP. The relief team will rest and sleep at the alternate FSE, located at division artillery headquarters. Identical maps and charts will be maintained at the alternate location and will be posted by the relief team before retiring. Documents for which no duplicates are available will be transferred to the alternate FSE in the event a move is

imminent. The alternate FSE will be manned by the off-duty team while the duty team is displacing and will be prepared to carry on operations until the duty team has completed its displacement and is ready to assume responsibility.

b. At the primary location, the FSE will be housed within an expansible van M292. (Division headquarters is authorized four M292 expansible vans by TOE—one for the G2 sections, one for the G4 section, and two for the G3 section. For SOP purposes, the FSE van was obtained from G3.) The FSE will be located between the G2 element and the G3 element. Figure 6–3 shows the internal arrangement of the FSE in the M292 expansible van.

c. The alternate FSE will be housed in a tent complex in the division alternate TOC. Since the TOE does not provide duplicate communications facilities, coordination with other elements at the alternate TOC will be necessary to obtain AM and FM message monitoring for the FSE.

U–5. FSE TEAMS

a. The FSE is normally operated by teams. Each team will work a 12-hour shift. Team changes should coincide with those of other DTOC elements and with daily briefings to provide a minimum of disruption in operations.

b. Personnel for each team are as follows:

Team 1	*Team 2*
Asst FSCOORD (LTC)	Asst FSCOORD (MAJ)
Target analyst	Target analyst
FA intelligence officer	Chemical officer
Chemical officer	Intelligence sergeant
Operations Sergeant	NBC Sergeant
NBC Sergeant	Chief fire direction computer
Asst Chief FD computer	Team chief (comm)
Clerk typist	Radiotelephone operator
RATT operator	RATT operator

U–6. FSE AUTHORIZED EQUIPMENT AND NECESSARY AUGMENTATIONS

See appendix I (Division FSE Authorized Equipment and other Equipment).

U–7. FSE LOADING LISTS

See appendix II (Division FSE Loading Lists).

U–8. REPRESENTATIVES FROM OTHER ELEMENTS

a. It is highly desirable to collocate the FSE with the TASE and ACE and to have the naval gunfire representative (when available) present.

b. The representatives mentioned above provide necessary equipment for performing their functions while in the FSE

U–9. ASSISTANT FSCOORD (MOS 51199) (LTC), CHIEF, FSE; AND ASSISTANT FSCOORD (MOS 51199) (MAJ)

One assistant FSCOORD will be present in the FSE at all times. The assistant FSCOORD—

a. Represents the FSCOORD at the division command post.

b. In coordination with the division artillery, S2 insures that organic and attached nuclear capable artillery units are correctly positioned.

c. Establishes, supervises, and coordinates the activities of the FSE.

d. Prepares the fire support annex and reviews all appendixes.

e. Recommends special ammunition allocations/assignment and special ammunition loads in coordination with the appropriate TOC element.

f. Keeps the FSCOORD, G3, and CS advised of the status of current allocations/assignment and the location of special ammunition.

g. Presents daily briefings to the CG and staff.

h. Insures that all charts, records, and maps are current.

i. Insures that required reports are submitted.

j. Reviews target nominations from the FA intelligence officer and recommends precedence and method of attack.

k. Insures that the strike warnings are disseminated.

l. Resolves conflicts and duplications between fire support agencies.

m. Insures that higher and adjacent headquarters (as necessary) are notified of the intent to fire all special ammunition at least 30 minutes before TOT.

n. Insures that related elements of the TOC are informed of the capabilities and employment of all fire support means.

o. Insures that all fire support is coordinated with tactical operations through close liaison with the G3 element and that fire support is properly interfaced with airspace coordination through close liaison with the ACE.

p. Recommends the organization for combat of fire support agencies.

q. Recommends available supply rates of conventional ammunition.

r. Advises the CG and his staff on all fire support matters concerning the most effective and efficient employment and delivery of fire support on surface targets.

s. Recommends to the G3 the locations of coordinating, safety, and limiting measures, based on coordination with higher, lower, and adjacent headquarters.

t. Makes plans and estimates as required.

U–10. FIELD ARTILLERY INTELLIGENCE OFFICER (MOS 59301) (CPT)

The artillery intelligence officer—

a. Assembles, collates, and integrates information from the G2 and division artillery S2 on potential targets.

b. Determines additional target intelligence needs and transmits these to the G2 and division artillery S2.

c. Uses all available information to determine and define the size, shape, composition, internal dsiposition, vulnerability, recuperability, and military importance of potential special ammunition.

d. Insures that all personnel in the FSE receive timely information and intelligence on potential targets.

e. Maintains an intelligence situation overlay in the FSE. This overlay should include as a minimum all suspect and confirmed enemy nuclear delivery units, the locations of friendly long-range reconnaissance patrols, and information on enemy fire support organization and capabilities.

f. Prepares a hostile battery list of enemy nuclear delivery units.

g. Furnish targets to the target analyst and chemical officer for detailed analysis, as appropriate.

h. Recommends to the duty team chief whether targets should be attacked by special or conventional ammunition.

i. Recommends to the assistant FSCOORD the method of attack of targets.

j. Performs target prediction.

k. Passes to the G2 (G2 air), immediately after approval by the CG or his representative, the requests for tactical damage assessment of each special ammunition strike originated at the FSE. May also pass on requests for tactical damage assessment from brigade FSCC's to the G2 (G2 air).

l. Acts as the classified material control officer within the FSE.

m. Performs other duties as prescribed by the chief of the FSE.

U–11. TARGET ANALYST (MOS 59301) (CPT)

Two target analysts are authorized. The target analysts perform the duties listed in *a* through *f* below.

a. Make detailed analyses of targets as directed by the assistant FSCOORD, chief of the FSE, or FA intelligence officer.

b. Prepare the nuclear fire support appendix.

c. Recommend the weapon, yield, HOB, DGZ, and delivery unit for division-directed strikes.

d. Prepare strike warnings, fire mission forms, and intent-to-fire messages.

e. Maintain the status of special ammunition.

f. Perform other duties as prescribed by the chief of the FSE.

U–12. OPERATIONS SERGEANT (MOS 13Z50) (E–8)

The operations sergeant—

a. Supervises the installation of operational equipment and communication facilities in the FSE.

b. Supervises administrative matters pertaining to the FSE.

c. Assists in the preparation of strike warnings, fire mission forms, and intent-to-fire messages.

d. Insures that firing units are alerted to special ammunition missions.

e. Supervises the maintenance of all FSE equipment.

f. Monitors all journal entries for content, time, and actions necessary or completed.

g. Insures that strike warnings are distributed to the division artillery FDC, the ACE, the TASE, and the G3 element.

h. Verifies the locations of all fire support agencies as often as necessary to insure the timely posting of the situation map and the capabilities overlay.

i. Supervises the posting and maintaining of all charts and records in the FSE.

j. Supervises the activities of all enlisted personnel within the FSE.

k. Coordinates the local perimeter defense with the G3 element operations sergeant.

l. Maintains and posts OPORD's and OPLAN's.

m. Assists in the preparation of the fire support annex and the nuclear fire support appendix.

n. Represents the FSE in the reconnaissance of new positions.

U-13 INTELLIGENCE SERGEANT (MOS 17Z50) (E-8)

The intelligence sergeant—

a. Assists with FA intelligence and Target Acquisition.

b. Sets up all maps, overlays, and charts in the FSE.

c. Posts encoded and decoded unit locations to the unit location chart and the situation map.

d. Secures and maintains necessary classified material. Obtains and distributes the current sign and countersign to the FSE.

e. Insures that the chemical section has the current meteorological data from the division or corps meteorological net.

f. Obtains effective downwind messages and NBC 3 (nuclear) reports from the chemical officer and forwards them to the division artillery S2.

U-14. CHIEF FIRE DIRECTION COMPUTER (MOS 13E40) (E-7)

The chief fire direction computer—

a. Performs the same duties as the operations sergeant.

b. Checks the decoding and encoding of messages.

c. Assists the target analyst.

d. Maintains the reaction times and locations of all nuclear-capable means, to include ADM's.

e. Maintains the ammunition status chart for conventional ammunition.

f. Assists in preparing and processing special ammunition strike warnings, mission reports, and other reports and messages as required.

U-15. ASSISTANT CHIEF FIRE DIRECTION COMPUTER (MOS 13E40) (E-6)

The assistant chief fire direction computer—

a. Assists the operations sergeant with his duties.

b. Plots units on the fire capabilities chart and keeps it current.

c. Maintains the situation map. Plots the targets to be attacked by special ammunition and reports to the target analyst the ranges to available delivery units.

d. Distributes strike warnings to the division artillery FDC, the ACE, the TASE, and the G3 elements.

e. Encodes and decodes all messages.

f. Obtains expendable supplies from the headquarters battery supply section.

g. Drives his assigned vehicle and trailer (FSE 3) and performs the required maintenance on them.

U-16. TEAM CHIEF (MOS 05C40) (E-5)

The team chief—

a. Establishes and maintains required ESC communications.

b. Details assignments and responsibilities to radio personnel.

c. Supervises the required recording of incoming and outgoing radio messages.

d. Keeps the operations sergeant informed of the status of radio equipment and personnel.

e. Supervises the maintenance of all communications equipment in the FSE.

f. Provides and maintains security protection for crypto material.

g. Insures that the latest CEOI items and other codes are available in the FSE.

U–17. CLERK TYPIST (MOS 71B30) (E–4)

The clerk typist—

a. Numbers and files in chronological sequence all incoming action messages in the FSE journal.

b. Maintains the FSE journal on DA Form 1594 (Daily Staff Journal for Duty Officer's Log) giving a brief statement of the content of each message and indicating the action taken.

c. Performs such clerical duties as may be directed, including typing and filing.

d. Posts all charts as directed.

e. Assists in decoding and encoding messages as necessary.

f. Installs and operates telephones and remoted FM radios.

g. Operates, services, and maintains generators.

h. Drives his assigned vehicle (FSE 1) and performs the required maintenance on it.

U–18. RADIOTELEPHONE OPERATOR (MOS 13A10) (E–3)

The radiotelephone operator—

a. Performs the same duties as the clerk typist.

b. Performs FM radio communications checks with the division artillery FDC.

c. Assists in servicing and maintaining FSE generators.

d. Drives his assigned vehicle (asst FSCOORD ¼-ton) and performs the required maintenance on it.

U–19. RADIO TELETYPEWRITER OPERATOR (MOS 05C20) (E–4)
Two radio teletypewriter operators are authorized. Each performs the following duties:

a. Operates as directed by the team chief.

b. Transmits and receives special ammunition fire missions and other traffic as directed, using codes or on-line crypto equipment.

c. Maintains accurate message logs.

d. Before departing the FSE after the new shift arrives, insures that an adequate supply of gasoline and oil is available for all generators and vehicles.

e. Drives his assigned vehicle (FSE 2 or 4) and performs the required maintenance on it.

f. Performs the required maintenance on radio set AN/GRC–142.

SECTION IV. MISSION PROCEDURES AND SUPPORTING DOCUMENTS

U–20. TYPES OF MISSIONS

a. The FSE can expect to receive requests for conventional air, field artillery, and naval gunfire. In addition, it may receive requests for all types of special ammunition fires, illumination missions, smoke missions and Army aviation fire support.

b. All requests, directives, and intents to fire will be handled within the FSE as shown in figures __ through __. (See appropriate figures in chap 6, 8 and 10).

U-21. MAPS, CHARTS, AND FORMS

a. The maps, charts, and forms listed in (1) through (3) below will be maintained in the FSE. A duplicate set will be kept at the alternate FSE.

(1) *Maps/overlays.*
Operations/intelligence situation map, 1:100,000.
Planning map, 1:25,000.
Map book, 1:50,000 (with matching air photographs).

(2) *Charts.*
Organization for combat and status of units.
Fire mission record.
Nuclear fire mission summary.
Allocation and/or assignment summary (special ammunition).
Distribution summary (special ammunition).
Fire capabilities chart (overlay).

(3) *Forms.*
Situation report.
Calls for fire from higher headquarters (conventional).
Calls for fire from higher headquarters (special ammunition).
Nuclear target analysis form.
NBC report form.
Tactical damage assessment report.
Naval gunfire call for fire.
Joint tactical air request form.
Joint tactical air reconnaissance/surveillance request.

b. Copies of the charts and forms listed in *a* above are contained in appendix N.

SECTION V. COMMUNICATIONS

U-22. INTERNAL ARRANGEMENT.

The team chief will insure that communication facilities are established in the FSE as shown in figure U-1. Telephones and radios used by other DTOC representatives in the FSE will be permanently provided by those elements. All equipment is mounted on or remoted into the M292 van to provide ease of operation.

U-23. RADIO NETS

The FSE/TASE will operate in or monitor the following nets:

Radio	*Net*
AN/GRC-142	Division artillery command/fire direction net 2, AM
AN/VRC-46	Division artillery command/fire direction net, FM
*MRC 107	Air Force tactical air request net/tactical air direction net
**PRC-47	Division naval gunfire support net, AM
***MRC-83	Naval gunfire control net, AM

U-24. VHF AND WIRE COMMUNICATIONS

a. The following communications circuits will be provided by the division signal battalion and will terminate in the two FSE SB22's, provided by the command operations signal company of the division signal battalion.

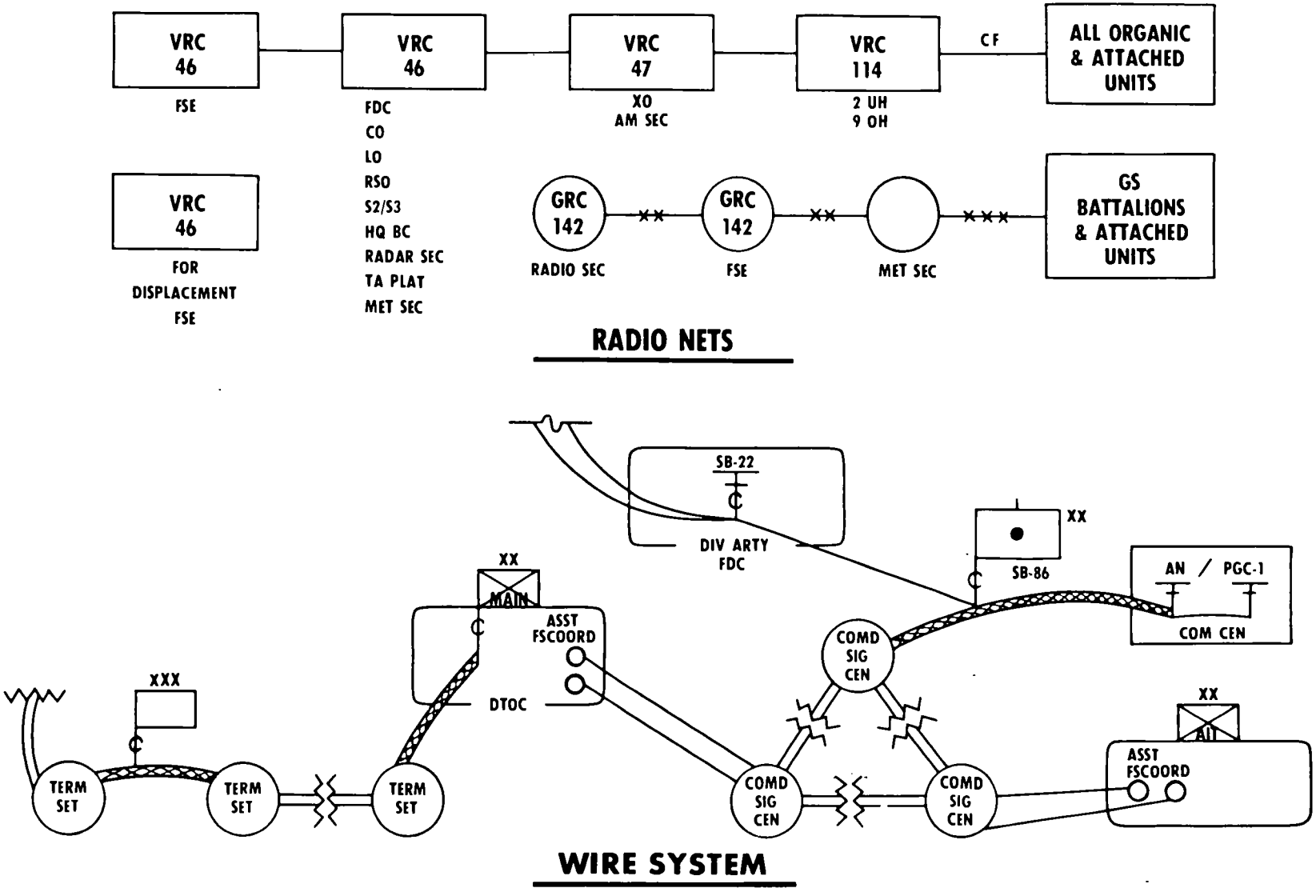


Figure U-1. Division FSE communications.

(1) One sole-user circuit to each brigade FSCC.
(2) One sole-user circuit to corps FSE.
(3) Two sole-user circuits to division artillery FDC.
(4) One sole-user circuit to division alternate FSE.
(5) Two lines to division main switchboard.

b. The FSE will be connected with other elements of the TOC through an intercom system (fig 6–3, and U–1).

U–25. BRIEFING PROCEDURES

a. Briefings will normally be conducted on a time schedule, as announced by the chief of staff. However, special briefings may be called by the division commander at any time. If the situation permits, the assistant FSCOORD coordinates all briefings with the division artillery commander as to details and contents.

b. The assistant FSCOORD will present the briefing for the FSE and representatives within the FSE. He will be assisted in the detailed preparation of the briefing by representatives at the FSE as required.

c. Copies of all briefings will be retained for report purposes.

U–26. BRIEFING AREAS

Generally, briefings should cover the following areas:

a. Air.

(1) Fighter-bomber sorties that are available to corps for the period concerned. (If applicable, include the number of sorties allocated to the division for planning purposes).
(2) Types of aircraft and ordnance available.
(3) Results of airstrikes in the division sector since the last briefing.
(4) Army air fire support results and availability.
(5) Air intelligence matters.
(6) Miscellaneous air matters.

b. Field Artillery.

(1) Organization for combat (any changes since the last briefing).
(2) Locations of artillery units, organic and attached.
(3) Missions fired and damage obtained; include the ammunition expenditure.
(4) Personnel and equipment losses to own artillery units. (Coordinate this with the G1 and G4 representatives so that the information is not duplicated).
(5) Status of conventional ammunition.
(6) Enemy artillery information.

c. Naval Gunfire (if applicable).

(1) Number and types of ships in support of the division for the period; missions assigned to the ships.
(2) Fire support areas and zones of fire.
(3) Missions fired and damage obtained; include the ammunition expenditures.

d. Special Ammunition.

(1) Allocations/assignment any remaining ammunition.
(2) Special ammunition loads.
(3) Missions fired by type of weapon and the tactical damage assessment.

(4) Ammunition lost because of enemy action, equipment failure, or accident; explain.

(5) Missions planned, on-call and scheduled, and recommendations for inclusion in planning.

e. Concept of Fire Support for Current and Planned Operations.

2 Incl

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